



Arlington Conservation Commission

Date: Thursday, April 20, 2023

Time: 7:00 PM

Location: Conducted by Remote Participation

Please register in advance for this meeting. Reference materials, instructions, and access information for this specific meeting will be available 48 hours prior to the meeting on the Commission's agenda and minutes page. Pursuant to State Legislation suspending certain provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the April 20, 2023, public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom. Please note: Not all items listed may in fact be discussed and other items not listed may be brought up for discussion to the extent permitted by law. This agenda includes those matters which can be reasonably anticipated to be discussed at the meeting.

Agenda

1. Administrative
 - a. Correspondence Received
All correspondence is available to the public. For a full list, contact the Conservation Agent at concomm@town.arlington.ma.us.
2. Discussion
 - a. Save the Date: Artificial Turf Forum 05/02 7PM
 - b. Arlington Catholic Artificial Turf Field
 - c. Symmes Conservation Restriction / Arlington 360
 - d. Water Bodies Working Group
 - e. Tree Committee Liaison
 - f. Park & Recreation Commission Liaison
 - g. Gas Leaks Task Force Update
3. Hearings

Notice of Intent: 1021 - 1025 Massachusetts Avenue (Continuation)

Notice of Intent: 1021 - 1025 Massachusetts Avenue (Continuation)

This public hearing will consider a Notice of Intent by 1025 Mass Ave LLC under the Wetlands Protection Act (and not the Arlington Bylaw for Wetlands Protection) to demolish two (2) structures and associated driveways, parking lots, and site appurtenances, and construct a 48-unit, 5-story

affordable housing condominium building (under Chapter 40B) with ground-level parking garage and retail space at 1021 and 1025 Massachusetts Avenue, within the outer portion of Riverfront Area associated with Mill Brook.



Town of Arlington, Massachusetts

Notice of Intent: 1021 - 1025 Massachusetts Avenue (Continuation)

Summary:

Notice of Intent: 1021 - 1025 Massachusetts Avenue (Continuation)

This public hearing will consider a Notice of Intent by 1025 Mass Ave LLC under the Wetlands Protection Act (and not the Arlington Bylaw for Wetlands Protection) to demolish two (2) structures and associated driveways, parking lots, and site appurtenances, and construct a 48-unit, 5-story affordable housing condominium building (under Chapter 40B) with ground-level parking garage and retail space at 1021 and 1025 Massachusetts Avenue, within the outer portion of Riverfront Area associated with Mill Brook.

ATTACHMENTS:

	Type	File Name	Description
▢	Reference Material	1021_mass_ave_CD_rev3_kzla_stamps_2023-0414.pdf	1021-1025 Mass Ave Planting Plan
▢	Reference Material	1021-1025_Mass_Ave_Full_Plan_Set_04-14-23.pdf	1021-1025 Mass Ave Plan Set
▢	Reference Material	1021-1025_Mass_Ave_SWR_04-14-23.pdf	1021-1025 Mass Ave Stormwater Report
▢	Reference Material	2023_0317_Revised_CMP_9658.pdf	1021-1025 Mass Ave Construction Management Plan

MAJ INVESTMENT, LLC

THE RESTORED WOODLAND AND OFF-SITE RIVERFRONT AREA RESTORATION SHALL BE MANAGED FOR INVASIVE SPECIES DURING THEIR RESPECTIVE MONITORING PERIODS TO DETERMINE IF ANY INVASIVE/EXOTIC PLANTS INCLUDED ON THE INVASIVE PLANT LIST PROVIDED BY THE MASSACHUSETTS INVASIVE PLANTS ADVISORY GROUP HAVE COLONIZED THE RESTORED WOODLAND AND/OR OFF-SITE RIVERFRONT AREA RESTORATION ON THE MILL BROOK CONDO PROPERTY. SPECIFICALLY, THESE AREAS SHALL BE EVALUATED ONCE ANNUALLY DURING THE LATE SPRING/EARLY SUMMER TO DETECT INVASIVE EXOTIC PLANTS PRIOR TO SEED PRODUCTION.

OBSERVED INVASIVE PLANTS SHALL BE REMOVED FROM THE SITE EITHER BY HAND OR WITH HAND TOOLS (SHOVELS, WEED WRENCHES, ETC.) TO THE EXTENT PRACTICABLE AND APPROPRIATELY DISPOSED OF OFF-SITE. IF NON-MECHANICAL REMOVAL IS NOT PRACTICAL, THEN THE STEM SHALL BE CUT FLUSH TO THE GROUND IN THE LATE SUMMER PRIOR TO SEED PRODUCTION, AND THE CUT STEM SHALL IMMEDIATELY BE PAINTED OR DABBED WITH GLYPHOSATE BY A CERTIFIED HERBICIDE APPLICATOR.

UPON REMOVAL OF INVASIVE SHRUBS OR SAPPLINGS, NATIVE SHRUBS OR SAPPLINGS FROM THE APPROVED RESTORATION PLANTING PLAN SHALL BE INSTALLED TO ADEQUATELY RE-VEGETATE THE EXPOSED AREA. REPLACEMENT NATIVE SHRUBS OR SAPPLINGS SHALL BE SELECTED BASED ON THE SIZE AND TYPE REFERENCED FOR THE AREA ON THE APPROVED RESTORATION PLAN, OR FUNCTIONAL EQUIVALENT NATIVE SHRUB OR SAPLING AT THE DISCRETION OF THE LANDSCAPE ARCHITECT OR WETLAND SCIENTIST CONDUCTING THE ANNUAL MONITORING AND OVERSEEING THE MANAGEMENT EFFORTS.

UPON THE REMOVAL OF NATIVE GROUND COVER PLANTS OR PERENNIALS, THE NATIVE SEED MIXTURE REFERENCED ON THE APPROVED RESTORATION PLANTING PLAN SHALL BE APPLIED TO THE MANAGED AREA AND RAKED IN PER THE MANUFACTURER'S SPECIFICATIONS.

1. PRIOR TO COMMENCING ANY EXCAVATION WORK, THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN ACCORDANCE WITH THE "DIG SAFELY" NOTIFICATION PROCEDURES PROMOTED BY RESPECTIVE UTILITY COMPANIES. THE DIG SAFE TELEPHONE NUMBER FOR MASSACHUSETTS IS 811.
2. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE DIAGRAMMATIC ONLY. THE CONTRACTOR SHALL CONTACT THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANY TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
3. ALL REFUSE, DEBRIS AND MISCELLANEOUS ITEMS TO BE REMOVED, THAT ARE NOT TO BE STOCKPILED FOR LATER USE ON THE PROJECT OR DELIVERED TO THE OWNER, SHALL BE LEGALLY DISPOSED OF OFF-SITE BY THE CONTRACTOR.
4. ALL ITEMS REQUIRING REMOVAL SHALL BE REMOVED TO FULL DEPTH TO INCLUDE BASE MATERIAL AND FOOTINGS OR FOUNDATIONS AS APPLICABLE, AND REUSED AS DIRECTED BY THE OWNER OR LEGALLY DISPOSED OF OFF-SITE BY CONTRACTOR.
5. CONTRACTOR SHALL STRIP AND STOCKPILE EXISTING TOPSOIL TO FULL DEPTH WITHIN LIMITS OF GRADING BEFORE COMMENCING EXCAVATION AND GRADING OPERATIONS. TOPSOIL SHALL NOT BE REMOVED FROM THE SITE, UNLESS APPROVED BY THE LANDSCAPE ARCHITECT.
6. AT ALL LOCATIONS WHERE CONCRETE PAVEMENT OR BITUMINOUS CONCRETE ROADWAY ABOUT NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAWCUT TO A CLEAN, SMOOTH EDGE.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES AND PLANTS DESIGNATED TO REMAIN FOR THE LENGTH OF THE CONSTRUCTION PERIOD. THE PLACEMENT OF PROTECTION DEVICES ADDITIONAL TO THOSE NOTED SHALL, HOWEVER, BE AT THE CONTRACTOR'S DISCRETION.
8. DAMAGE NO PLANTS TO REMAIN BY BURNING, BY PUMPING OF WATER, BY CUTTING OF LIVE ROOTS OR BRANCHES, OR BY ANY OTHER MEANS. NO PLANTS TO BE SAVED SHALL BE USED FOR CRANE STAYS, GUYS OR OTHER FASTENINGS. VEHICLES SHALL NOT BE PARKED WITHIN THE DRIP LINE OR WHERE DAMAGE MAY RESULT TO TREES TO BE SAVED. CONSTRUCTION MATERIALS SHALL NOT BE STORED BENEATH TREES TO BE SAVED.
9. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK.
10. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS THAT ARE DUE TO CONTRACTOR OPERATIONS AND WHICH ARE OUTSIDE THE LIMIT OF WORK.
11. THE GENERAL CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS LIGHT POLES, SIGN POLES, MAN HOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED ON THE UTILITY DRAWINGS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT.
12. THE GENERAL CONTRACTOR SHALL COORDINATE ALL ADJUSTMENT OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
13. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS. ANY MUD ON PUBLIC WAYS ORIGINATING FROM THE JOB SITE SHALL BE CLEANED BY THE CONTRACTOR.
14. CONTRACTOR SHALL SECURE ALL PERMITS THAT MAY BE REQUIRED FROM ALL JURISDICTION AFFECTED BY THIS WORK.
15. CONTRACTOR SHALL COORDINATE ALL PLACEMENT OF TREE PROTECTION TO BE APPROVED BEFORE DEMOLITION.

3	REVISION #3	04.13.2023
2	REVISION #2	02.17.2023
1	REVISION #1	01.23.2023
NO.	REVISION	DATE

kzla
 Kyle Zick Landscape Architecture, Inc.
 36 Bromfield Street Suite 202 617 451-1018 Tel
 Boston, MA 02108 www.kylezick.com

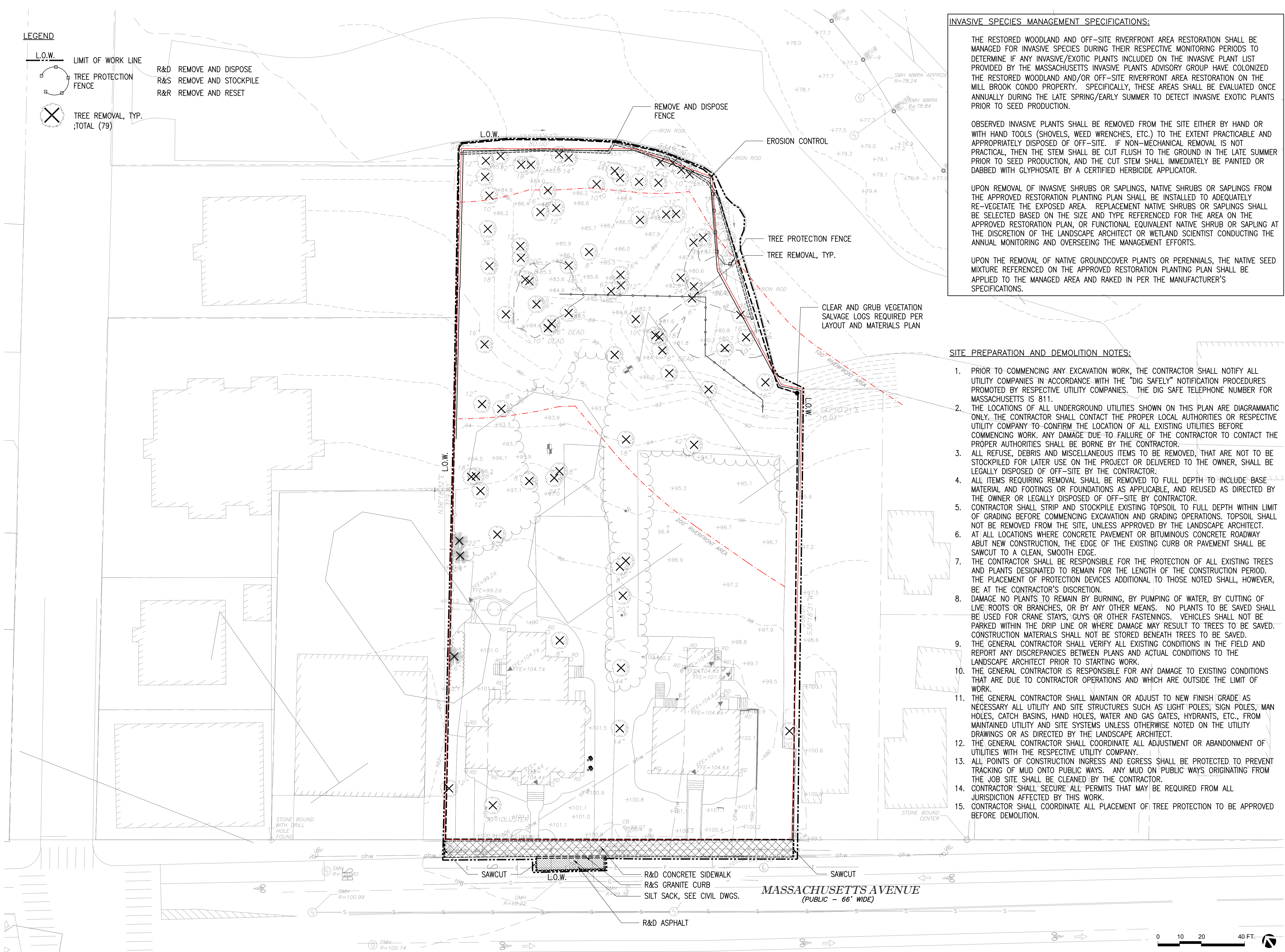


DRAFT CONSTRUCTION
DOCUMENT SET

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Project: 1021-1025 MASSACHUSETTS AVENUE	
Drawn By: YL	Checked By: KZ
Date: SEPTEMBER 8, 2022	
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Drawing Title:	

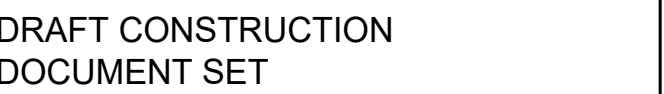
SITE PREPARATION PLAN

L1



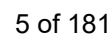
ARLINGTON, MASSACHUSETTS
MAJ INVESTMENT, LLC

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LAYOUT AND MATERIAL PLAN

L2

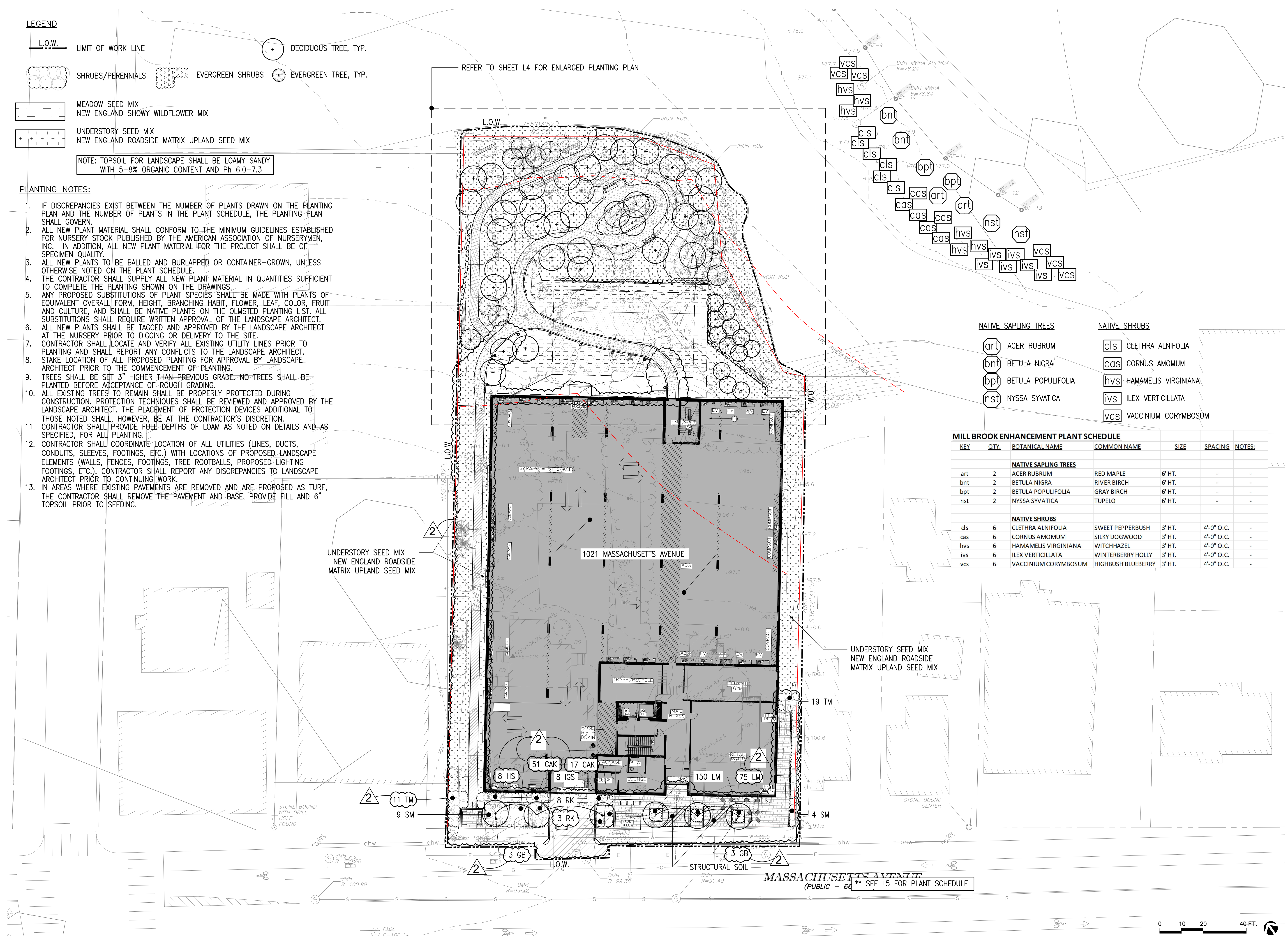


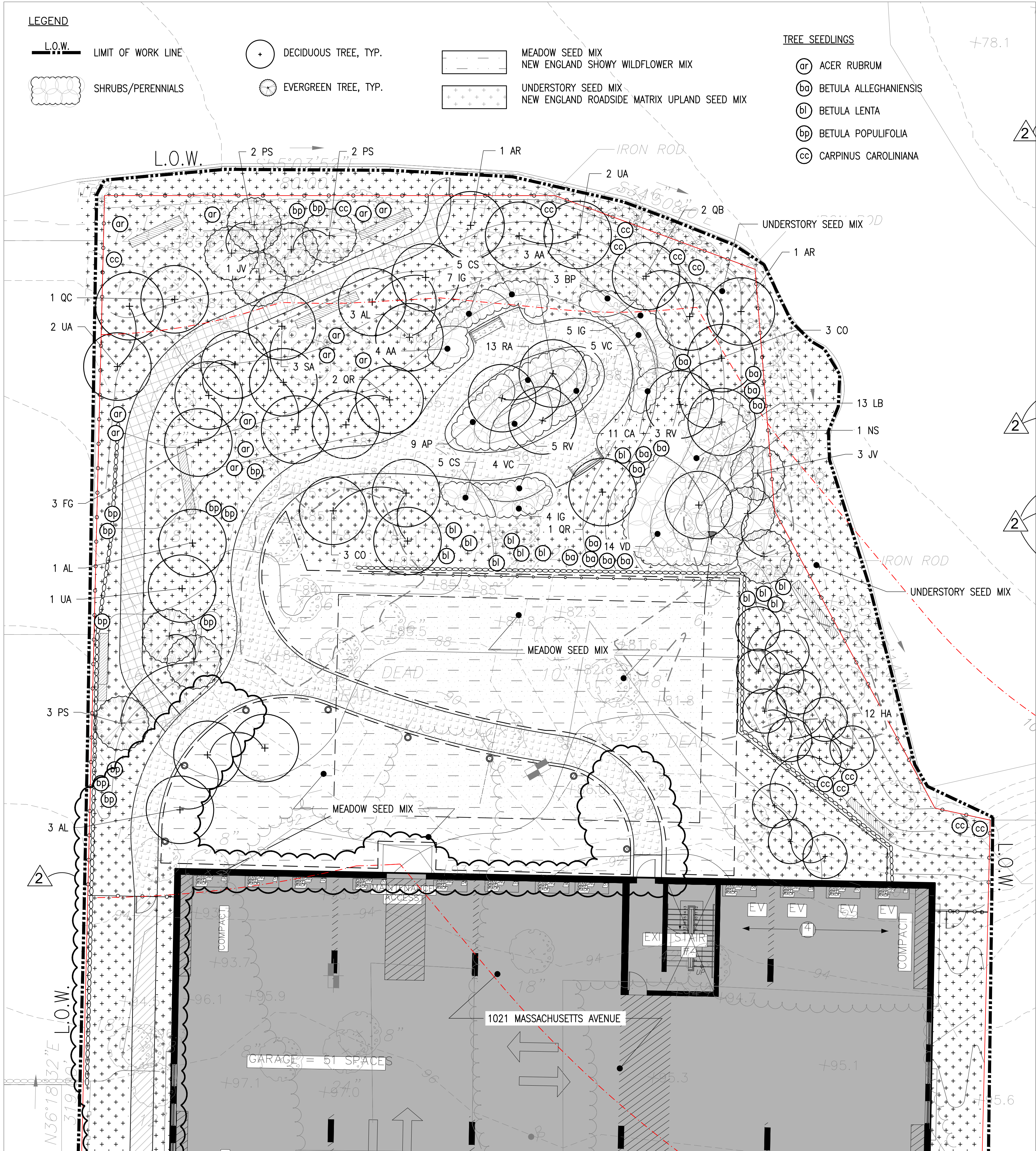
ARLINGTON, MASSACHUSETTS
MAJ INVESTMENT, LLC

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PLANTING PLAN

3





PLANT SCHEDULE					
KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
DECIDUOUS TREES					
AR	2	ACER RUBRUM	RED MAPLE	2" CAL.	-
AL	7	AMELANCHIER CANADENSIS L. MEDIK.	SHADBLOW SERVICEBERRY	12" HT.	-
BP	3	BETULA PAPIRIFERA	PAPER BIRCH	12" HT.	-
CO	6	CARYA OVATA	SHAGBARK HICKORY	1" CAL.	-
FG	3	FAGUS GRANDIFLORA	AMERICAN BEECH	1" CAL.	-
GB	6	GINKGO BILOBA 'PRINCETON SENTRY'	PRINCETON SENTRY GINKGO	3" CAL.	-
HA	12	HAMAMELIS X INTERMEDIA 'ARNOLD PROMISE'	WITCHHAZEL	8" B&B	-
NS	1	NYSSA SYLVATICA	SOURGUM	2" CAL.	-
QB	2	QUERCUS BICOLOR	SWAMP WHITE OAK	2" CAL.	-
QC	1	QUERCUS COCCINEA	SCARLET OAK	2" CAL.	-
QR	3	QUERCUS RUBRA	RED OAK	2" CAL.	-
SA	3	SASSAFRAS ALBIDUM	SASSAFRAS	1" CAL.	-
UA	5	ULMUS AMERICANA 'PRINCETON'	PRINCETON AMERICAN ELM	2" CAL.	-
TREE SEEDLINGS					
ar	12	ACER RUBRUM	RED MAPLE	4" HT.	-
ba	12	BETULA ALLEGHANIENSIS	YELLOW BIRCH	4" HT.	-
bl	12	BETULA LENTA	SWEET BIRCH	4" HT.	-
bp	12	BETULA POPULIFOLIA	GRAY BIRCH	4" HT.	-
cc	12	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	4" HT.	-
EVERGREEN TREES					
JV	4	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	6" HT.	-
PS	7	PINUS STROBUS	EASTERN WHITE PINE	6" HT.	-
SHRUBS					
AA	7	ARONIA ARBUTIFOLIA	RED CHOKEBERRY	36" HT.	5'-0" O.C.
AP	9	AESCULUS PARVIFLORA	BOTTLEBRUSH BUCKEYE	36" HT.	4'-0" O.C.
CA	11	CLETHRA ALNIFOLIA	SUMMERSWEET	24" HT.	3'-0" O.C.
CAK	68	CALAMAGROSTIS X ACUTIFLORA 'KAL FOERSTEER'	FEATHER REED GRASS	24" HT.	1'-6" O.C.
CS	10	CORNUS SERICEA	REDTWIG DOGWOOD	36" HT.	4'-0" O.C.
HS	8	HIBISCUS SYRIACUS	LIL' KIM ROSE OF SHARON	36" HT.	4'-0" O.C.
IG	16	ILEX GLABRA	INKBERRY	3 GAL.	4'-0" O.C.
IGS	8	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	3 GAL.	4'-0" O.C.
LB	13	LINDERA BENZOIN	SPICEBUSH	36" HT.	6'-0" O.C.
RA	13	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	24" SPREAD	3'-0" O.C.
RK	11	ROSA 'KNOCK OUT'	WHITE KNOCK OUT ROSE	24" HT.	4'-0" O.C.
RV	8	ROSA VIRGINIANA	VIRGINIA ROSE	36" HT.	5'-0" O.C.
SM	13	SYRINGA MEYERI 'PALIBIN'	DWARF KOREAN LILAC	36" HT.	4'-0" O.C.
TM	30	TAXUS X MEDIA 'HICKSII'	HICKS YEW	36" HT.	4'-0" O.C.
VC	9	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	24" HT.	4'-0" O.C.
VD	14	VIBURNUM DENTATUM	ARROWWOOD	36" HT.	5'-0" O.C.
GRASS					
LM	225	LIRIOPE MUSCARI	BIG BLUE LILYTURF	PLUGS	8" O.C.

1021-1025
MASSACHUSETTS
AVENUE

ARLINGTON, MASSACHUSETTS
MAJ INVESTMENT, LLC

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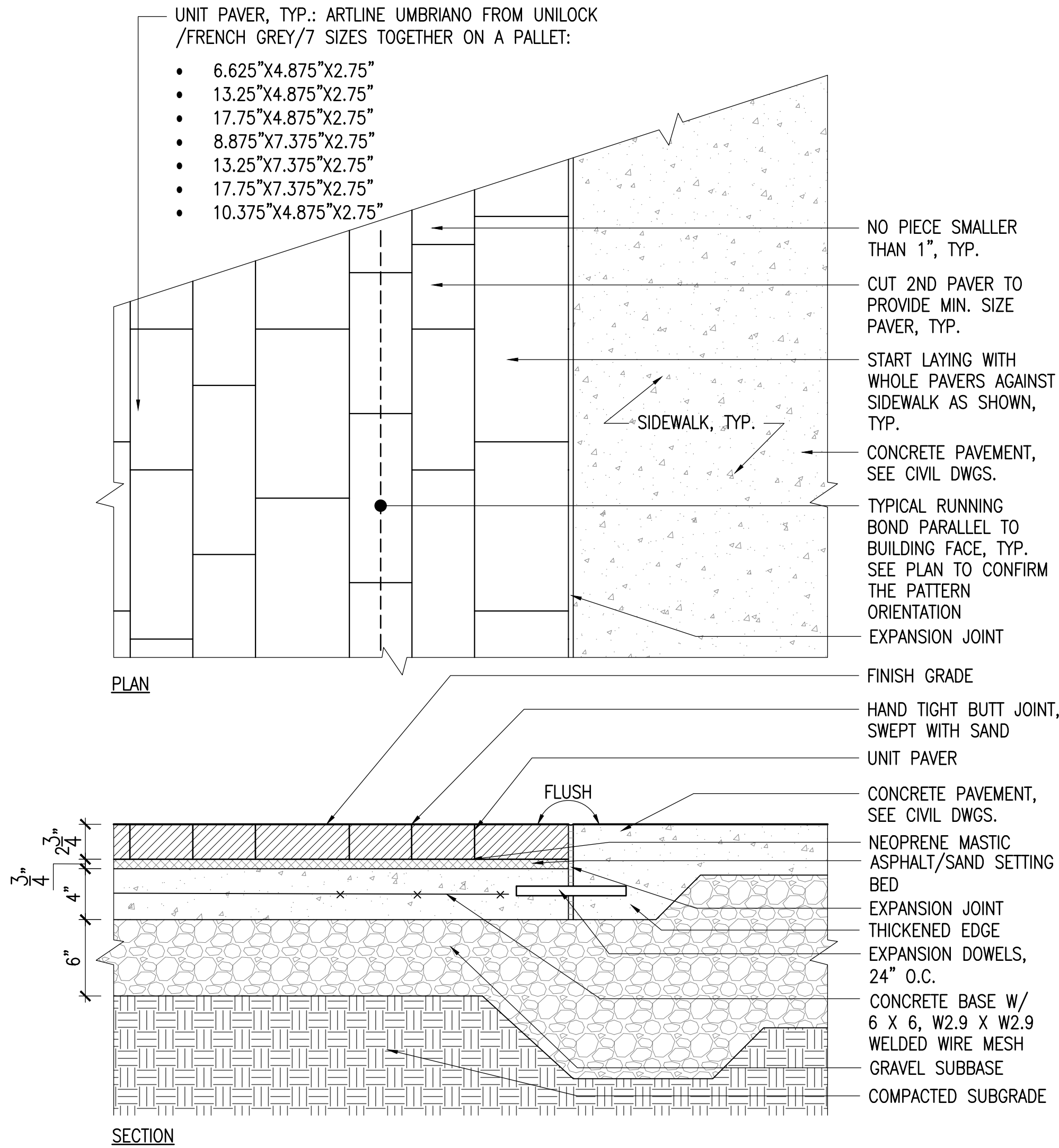
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Project: 1021-1025 MASSACHUSETTS AVENUE
Drawn By: YL
Checked By: KZ
Date: SEPTEMBER 8, 2022
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Drawing Title:

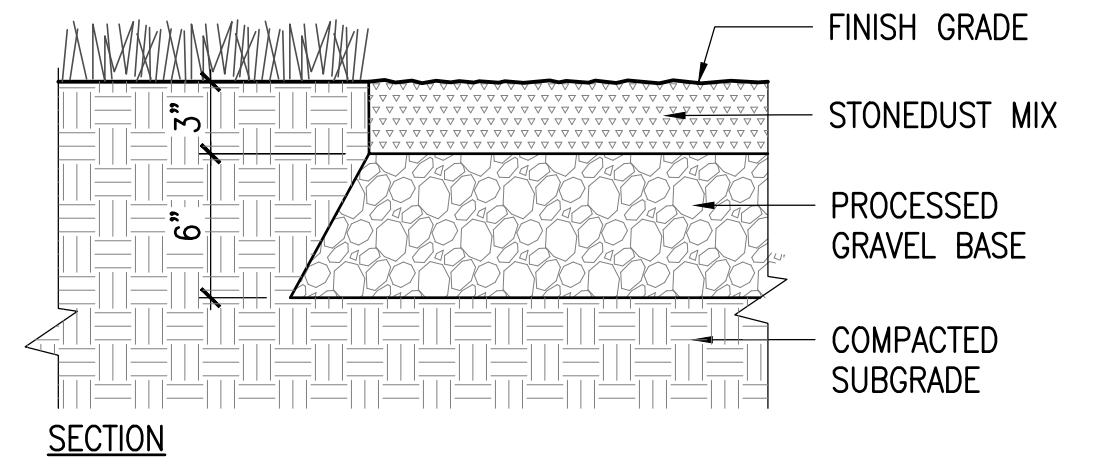
ENLARGED PLANTING PLAN

L4

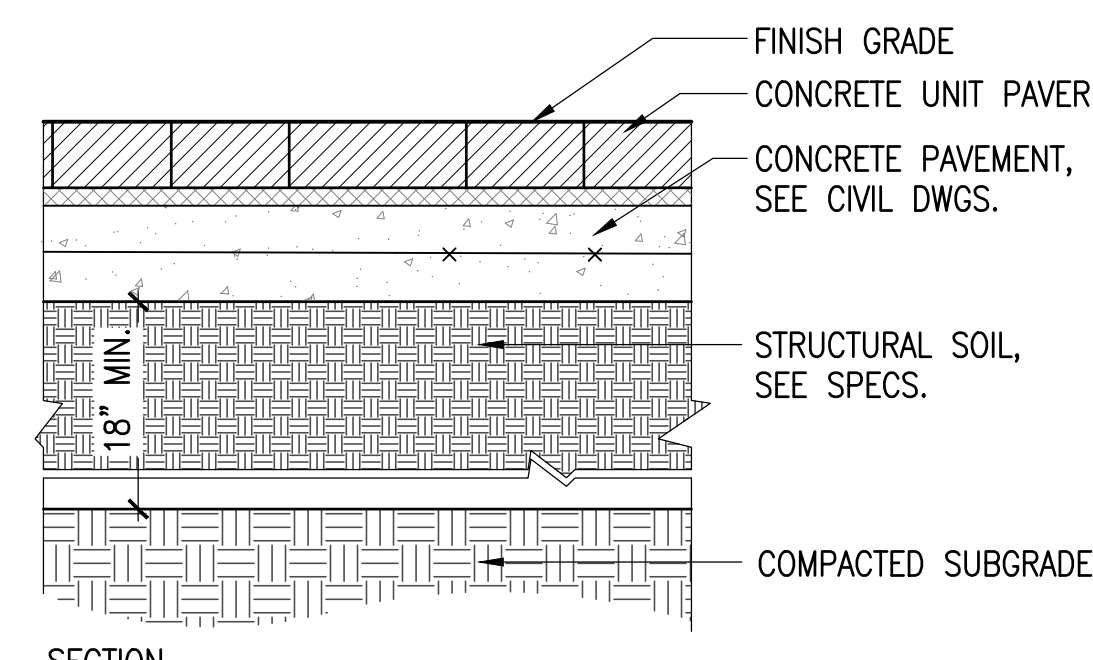




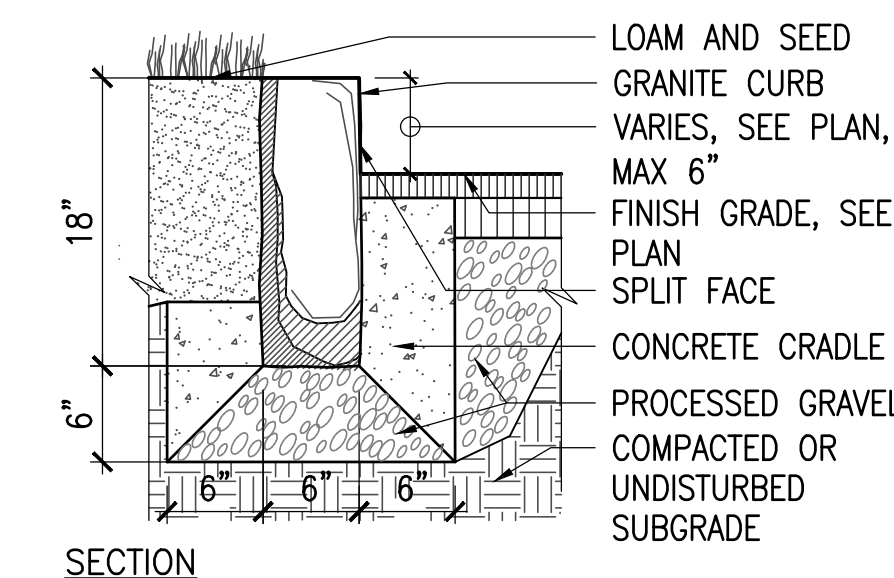
1 CONCRETE UNIT PAVER
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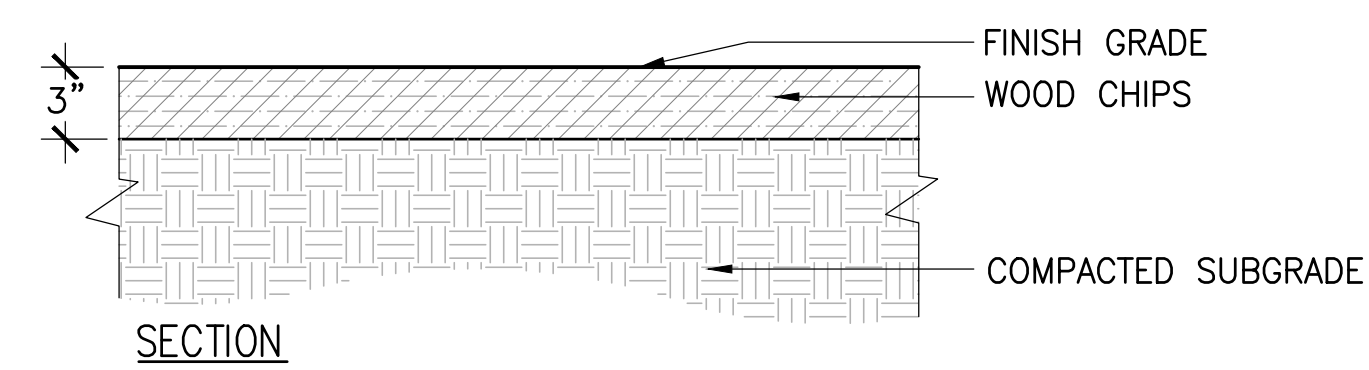
3 STONEDUST PAVEMENT
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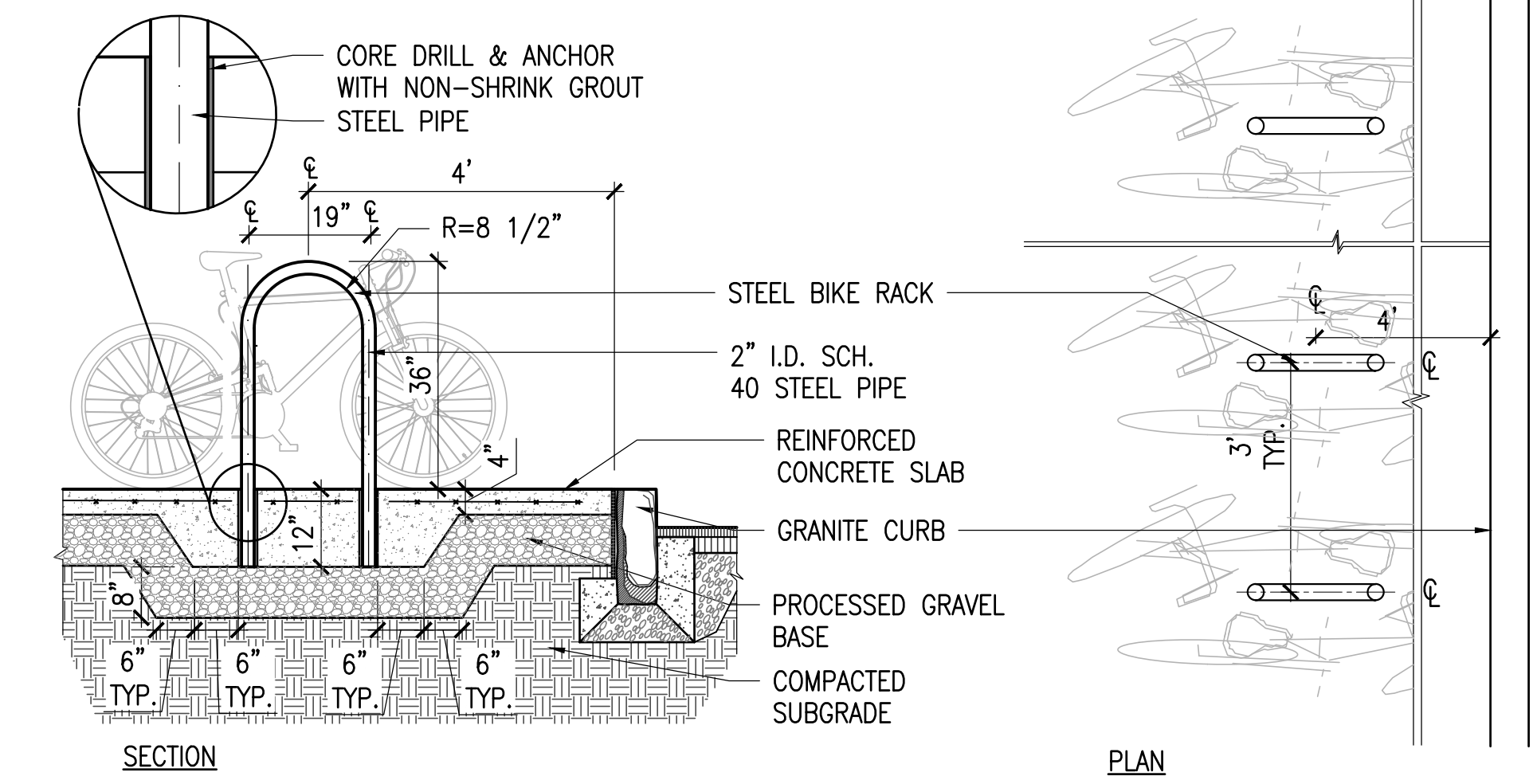
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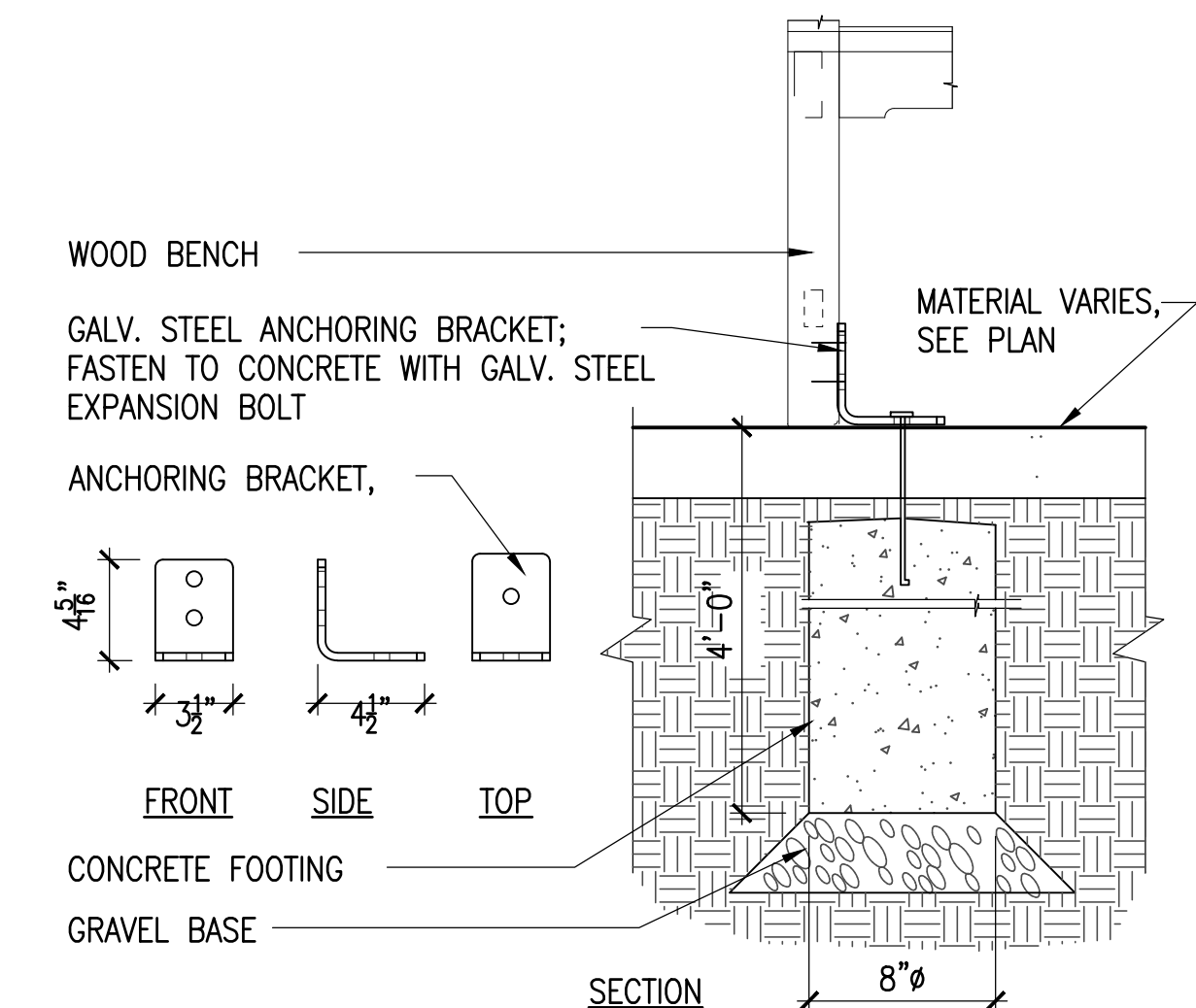
5 GRANITE CURB
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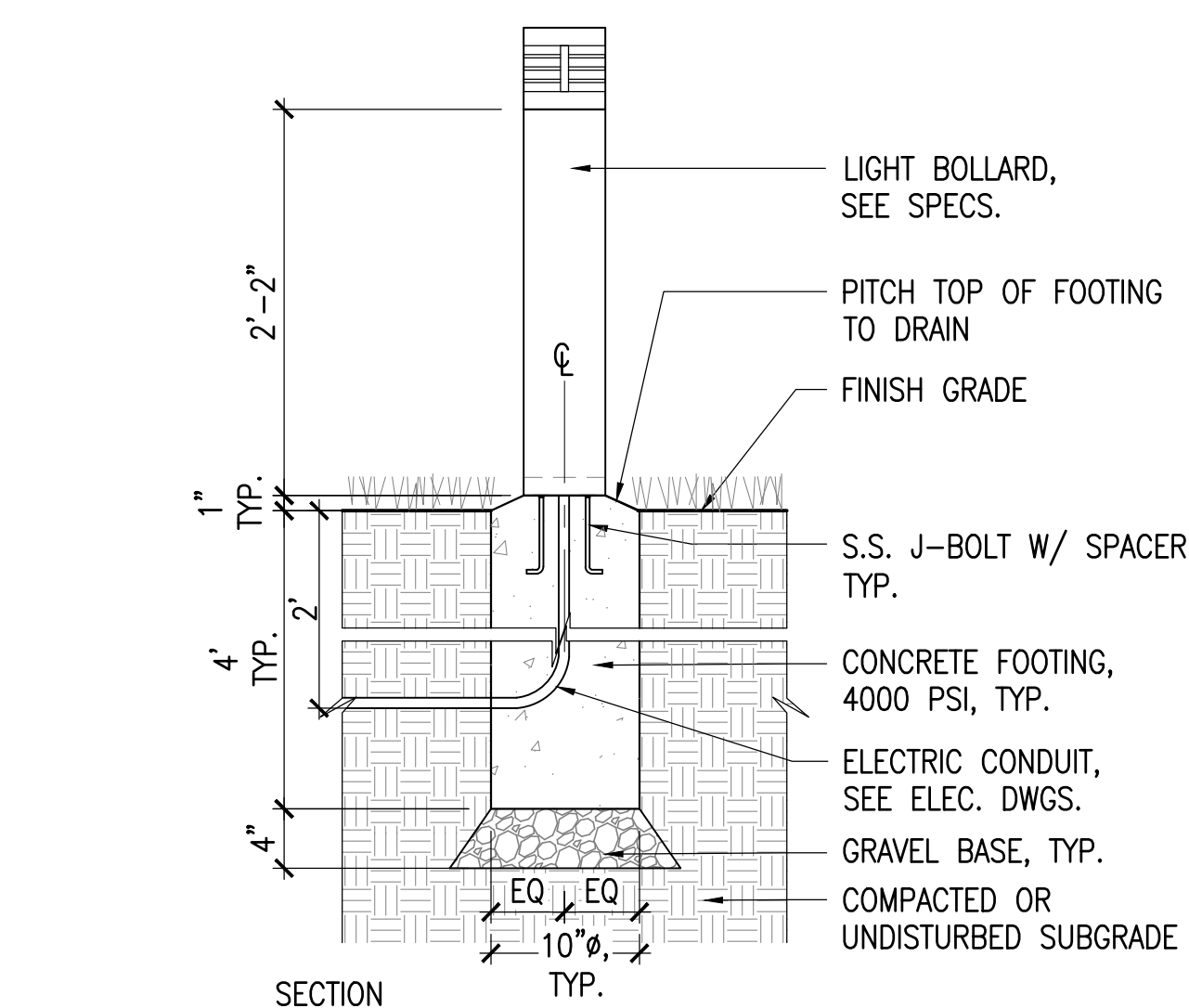
6 WOOD CHIP EMERGENCY ACCESS PATH
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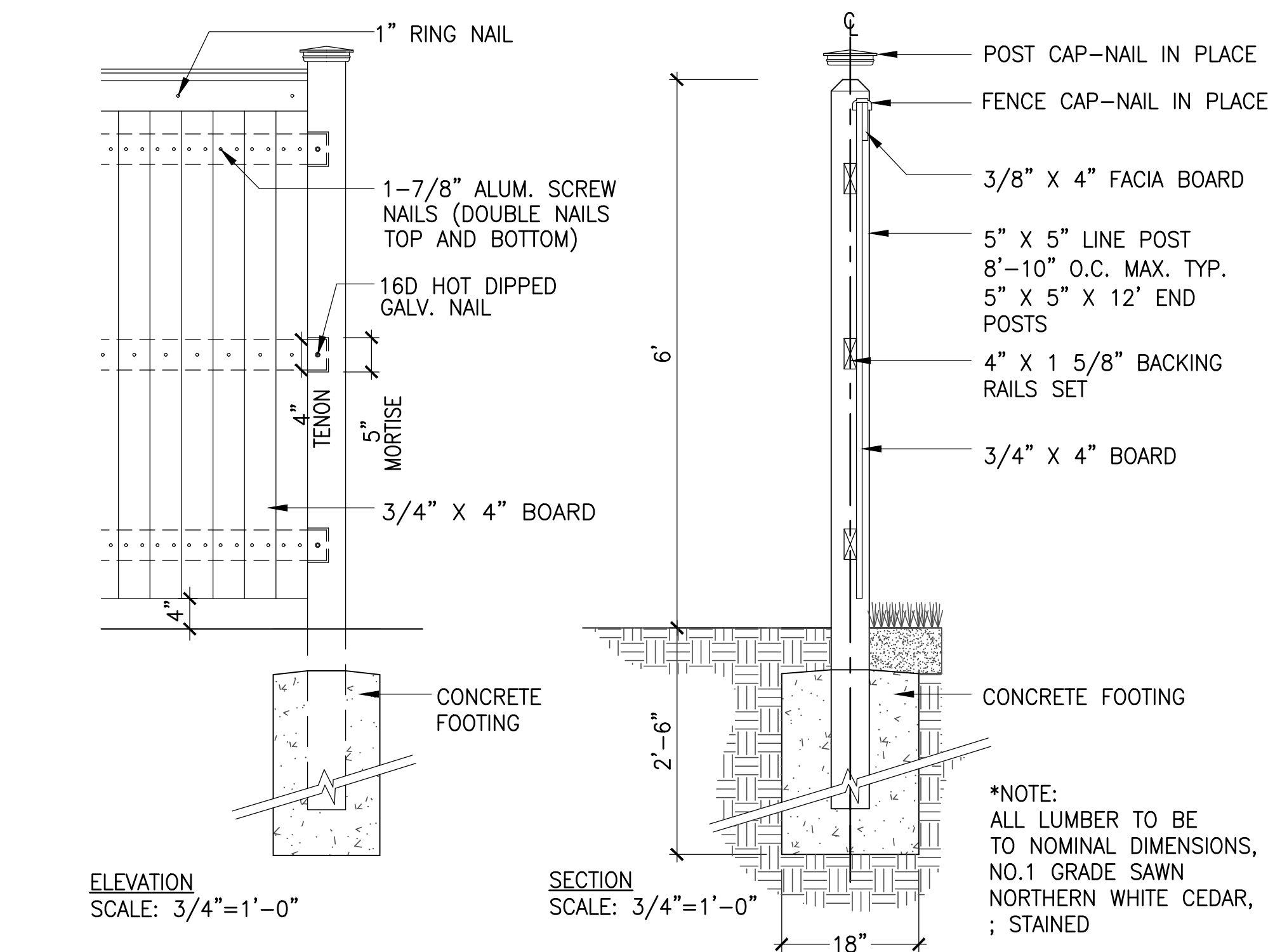
7 BIKE RACK
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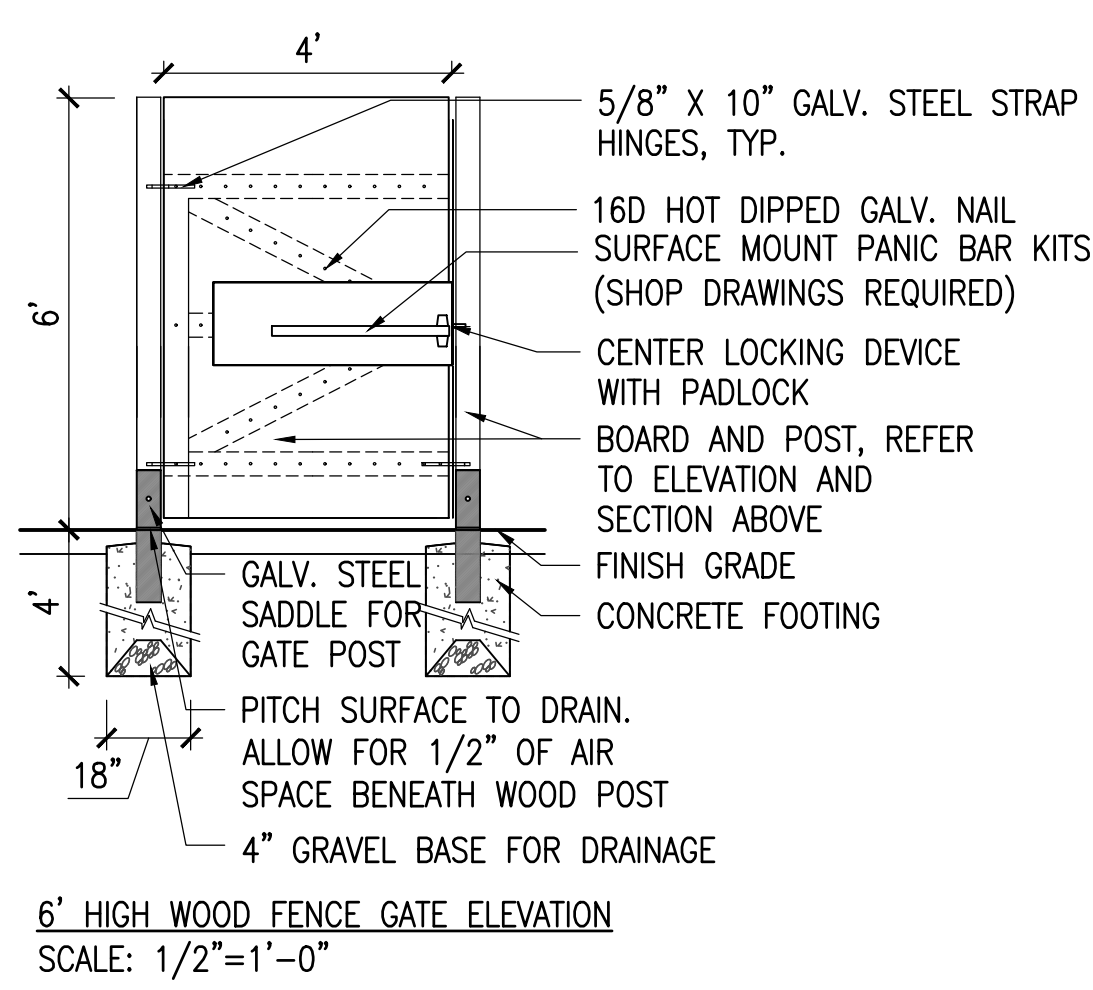
8 WOOD BENCH ANCHORING
SCALE: 1-1/2"=1'-0"



9 BOLLARD LIGHT FOOTING
SCALE: 1"=1'-0"



2 6' HT. SCREEN FENCE / GATE - CEDAR
SCALE: AS SHOWN



6' HIGH WOOD FENCE GATE ELEVATION
SCALE: 1/2"=1'-0"

1021-1025
MASSACHUSETTS
AVENUE

ARLINGTON, MASSACHUSETTS

MAJ INVESTMENT, LLC

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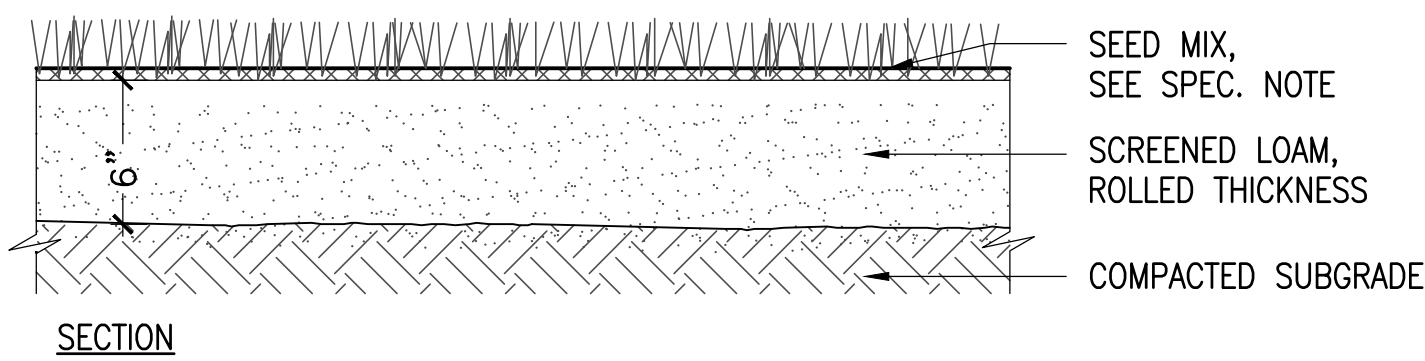
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DOCUMENT SET

Job Number:
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Drawn By: YL Checked By: KZ
Date: SEPTEMBER 8, 2022
Scale: 1"=20'-0"

Drawing Title:

DETAILS

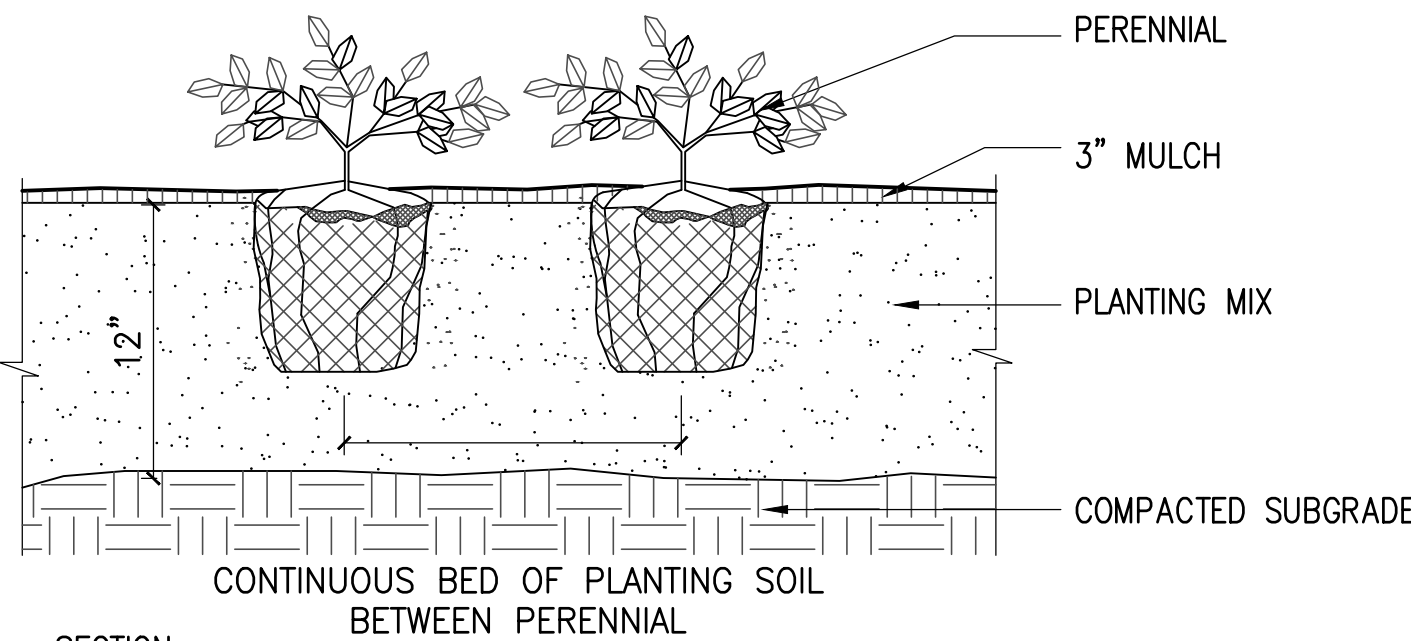
L5



SECTION

1 LAWN

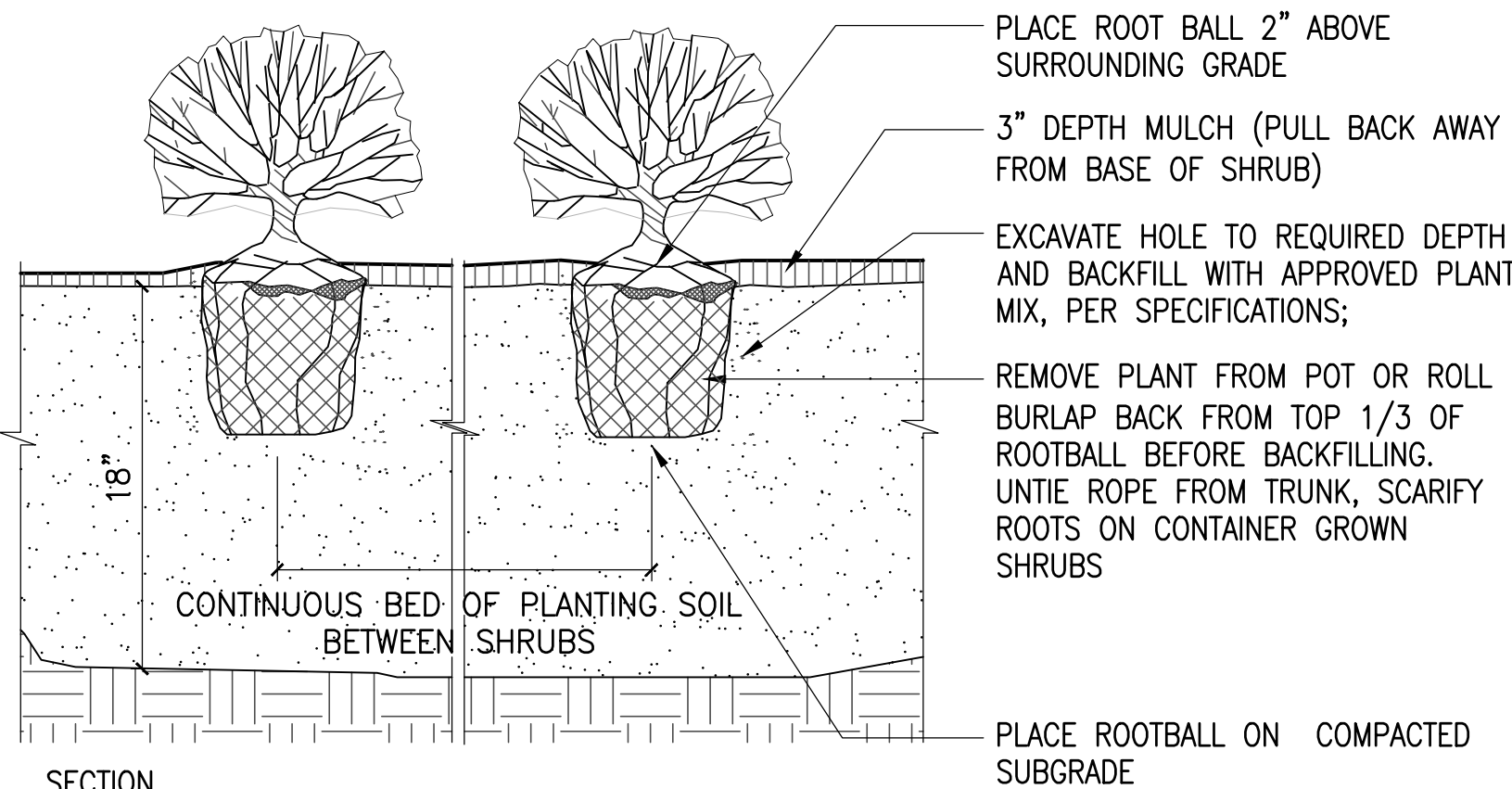
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SECTION

2 PERENNIAL PLANTING

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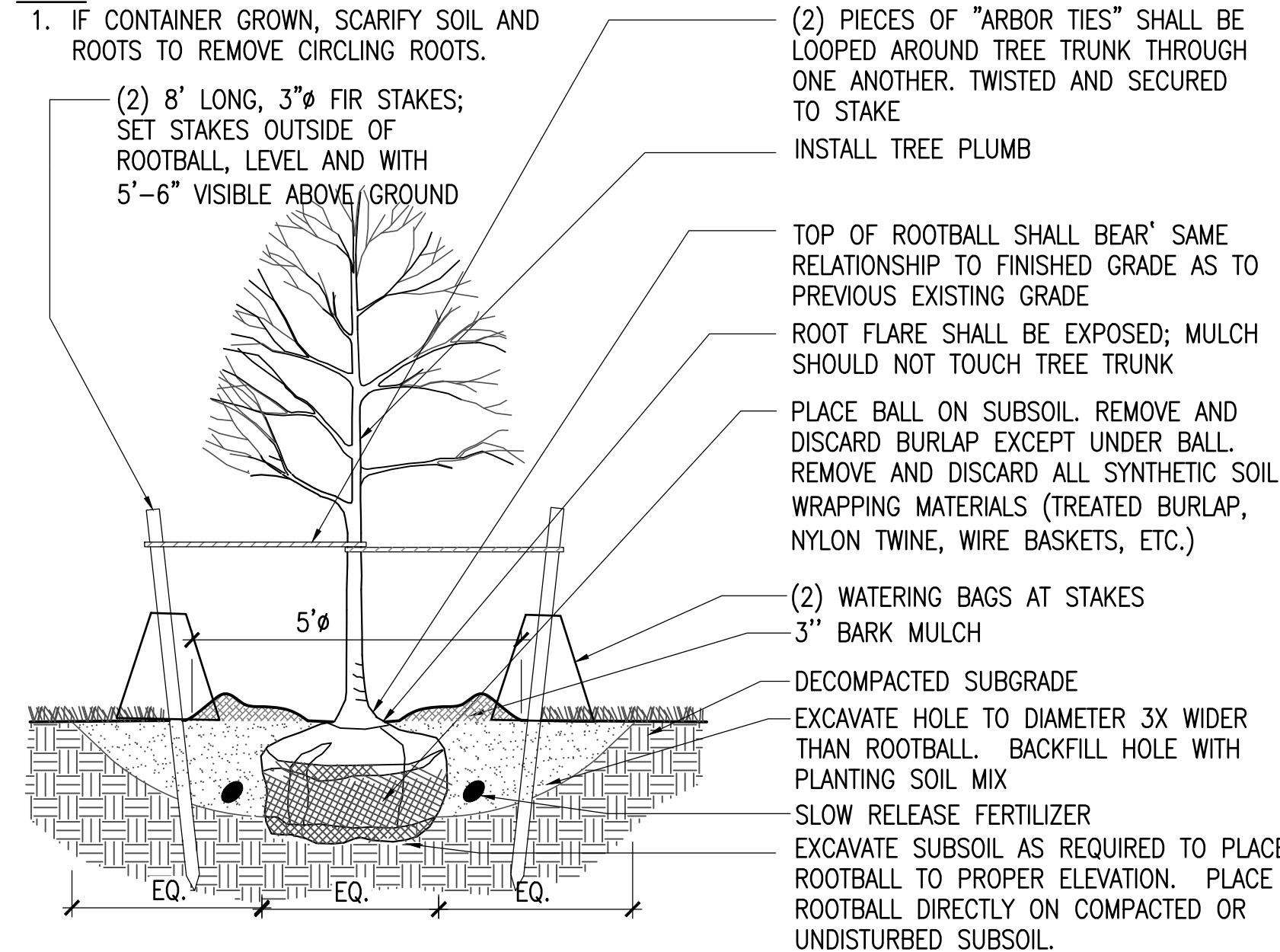


SECTION

3 SHRUB PLANTING

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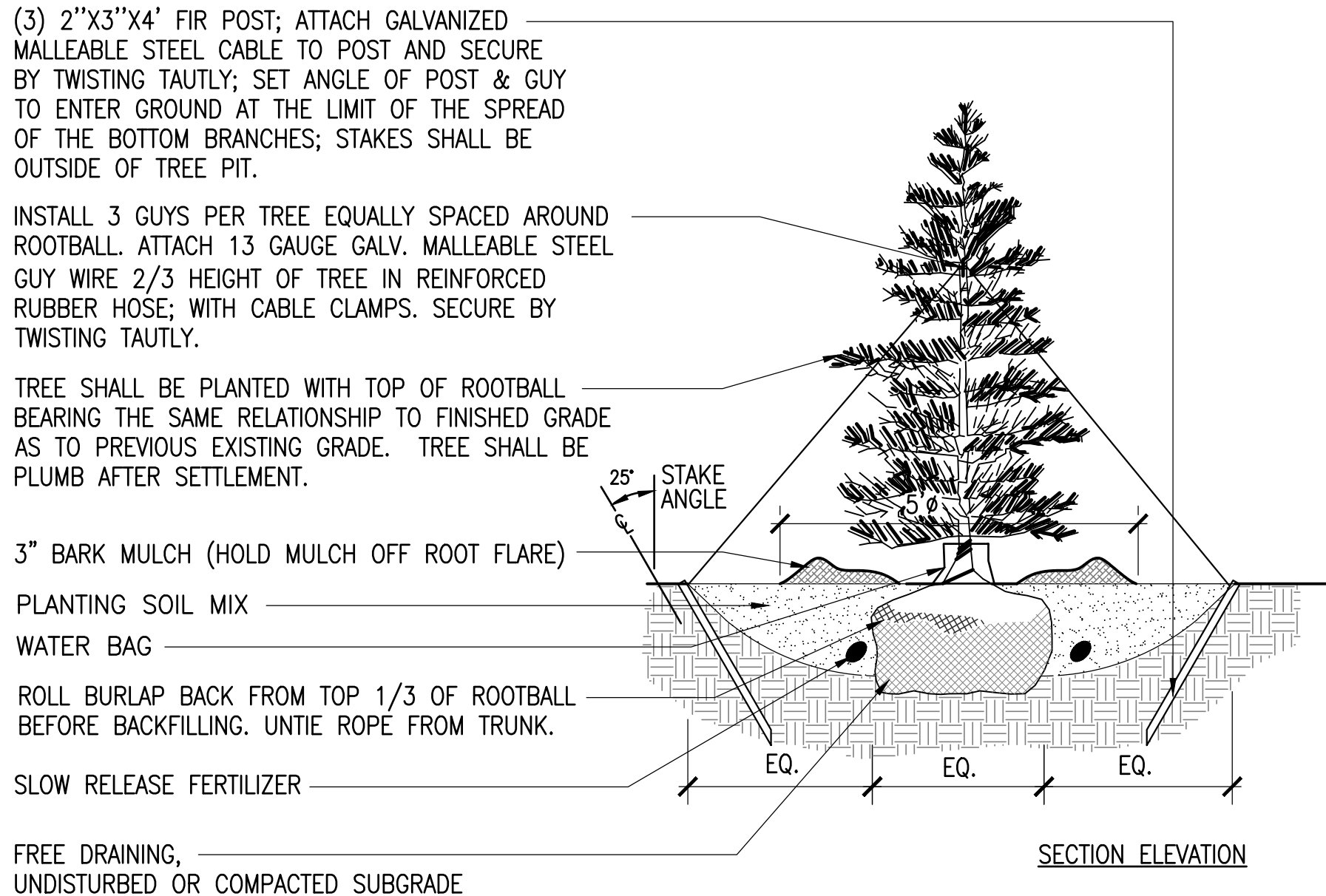
NOTES



SECTION ELEVATION

4 DECIDUOUS TREE PLANTING

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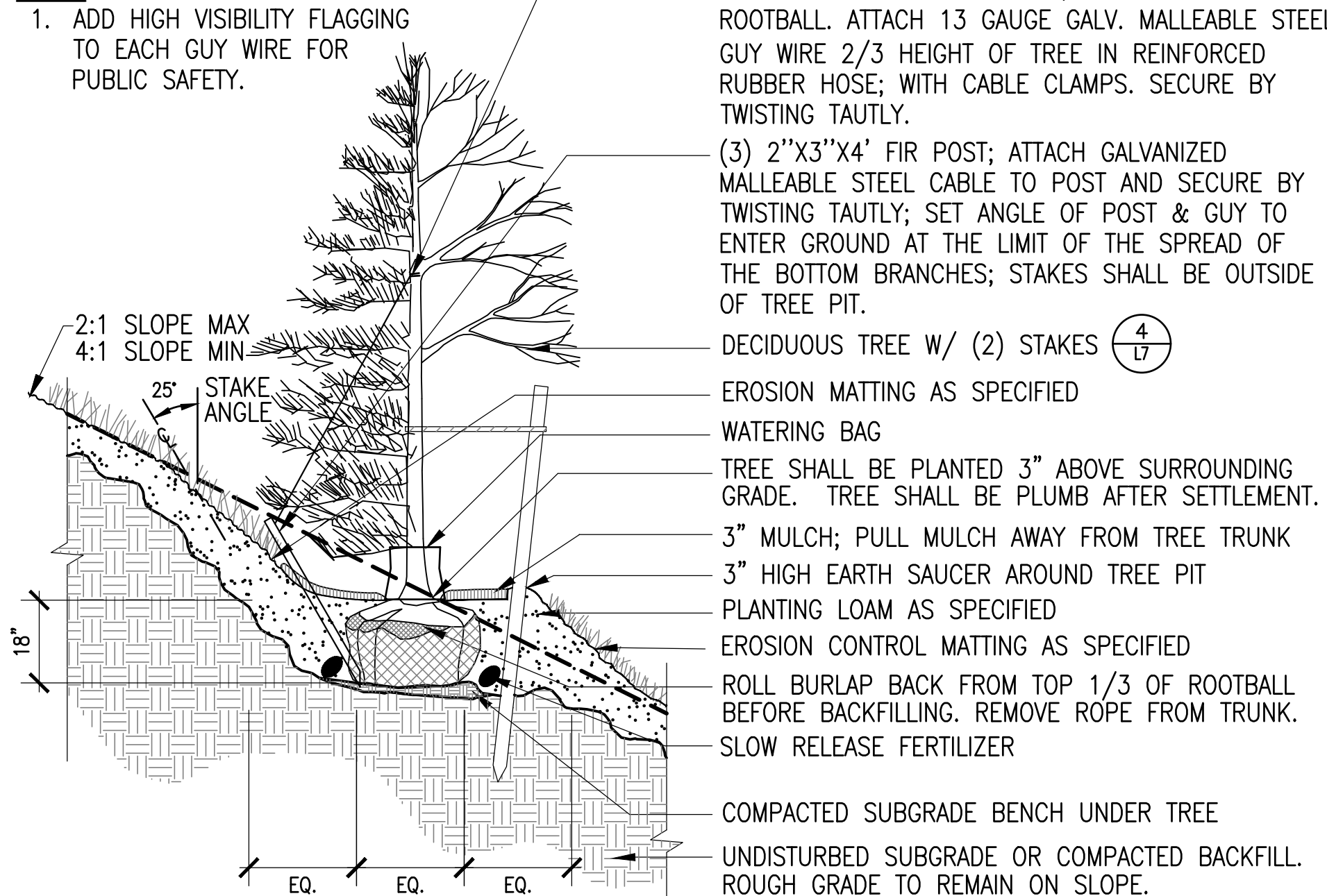


SECTION ELEVATION

5 EVERGREEN TREE PLANTING

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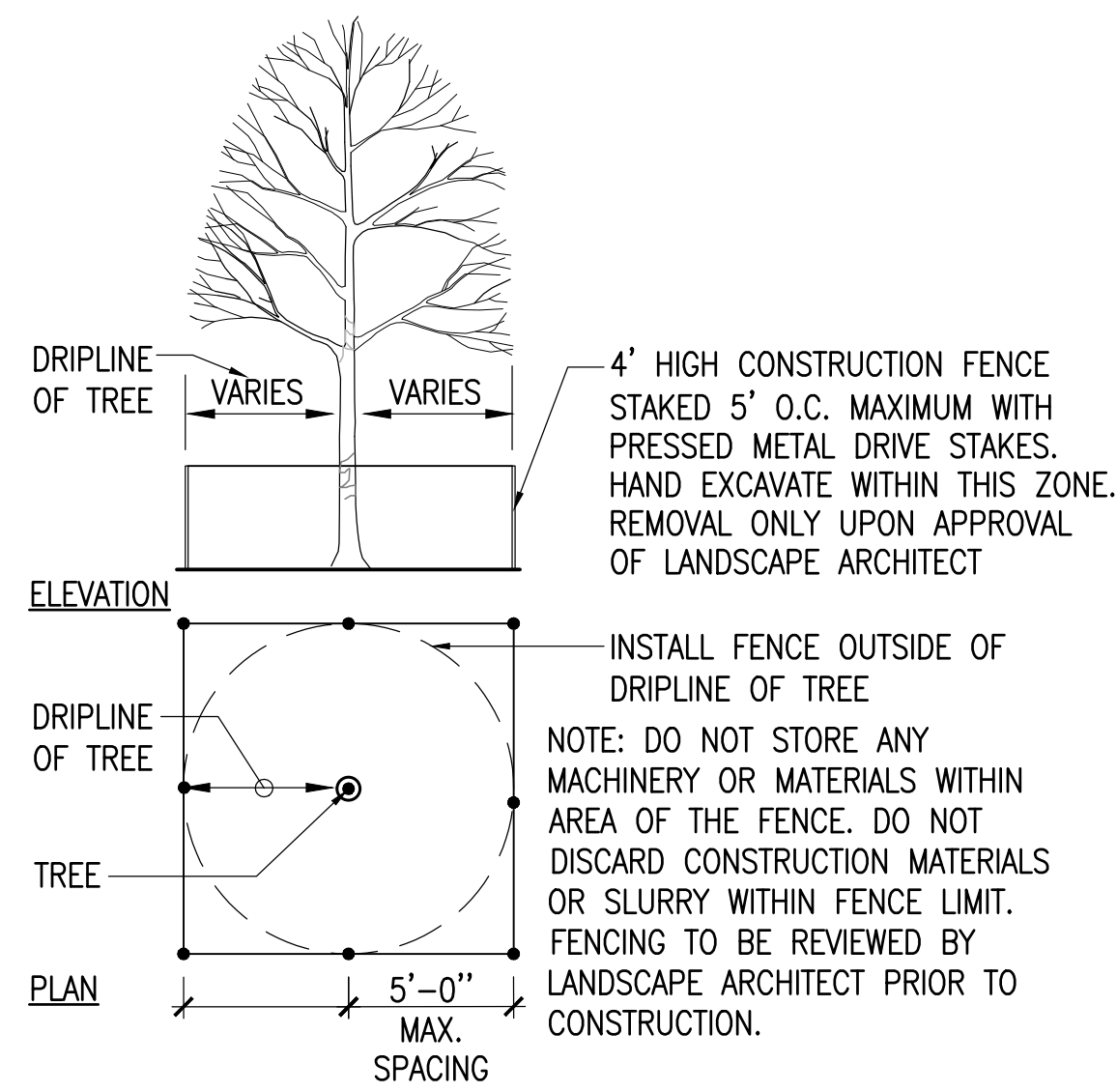
NOTES



SECTION ELEVATION

6 TREE PLANTING ON SLOPE

SCALE: N.T.S.



7 TREE PROTECTION - FENCE

SCALE: N.T.S.

1021-1025 MASSACHUSETTS AVENUE

ARLINGTON, MASSACHUSETTS

MAJ INVESTMENT, LLC

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DETAILS

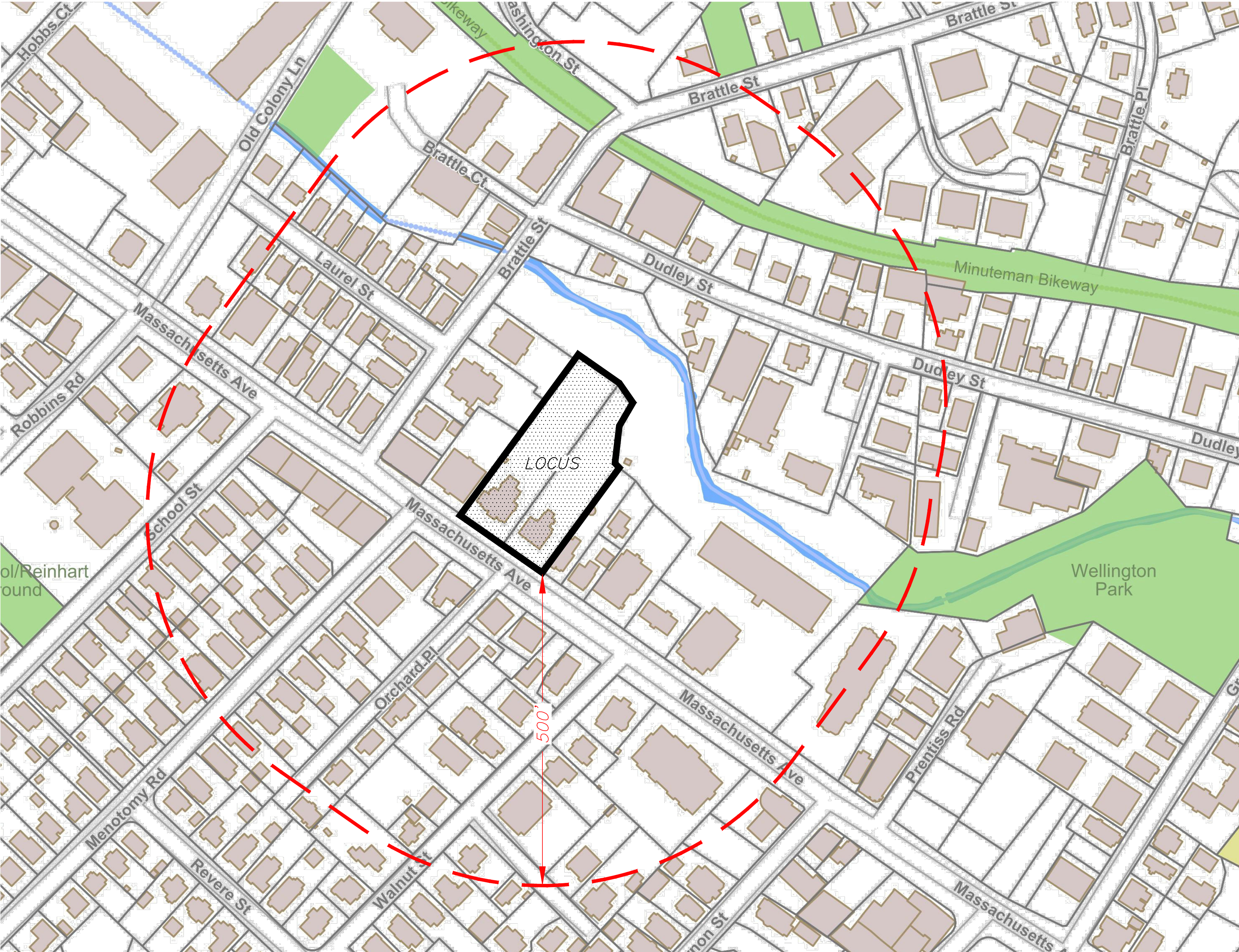
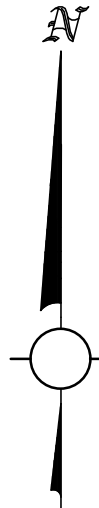
L6

NOTES:

1. THE INFORMATION DEPICTED ON THIS PLAN HAS BEEN COMPILED FROM THE TOWN OF ARLINGTON GIS SYSTEM

2. LAND USE WITHIN 500 FEET OF THE SUBJECT PROPERTY IS PRIMARILY SINGLE FAMILY DWELLINGS AND COMMERCIAL BUSINESSES, AND INCLUDES THE HIGHLAND FIRE STATION.

1021 & 1025 MASSACHUSETTS AVENUE
(1021 ASSESSORS MAP 55 LOT 19)
(1025 ASSESSORS MAP 55 LOT 20)
COMPREHENSIVE PERMIT PLAN SET
(TO ACCOMPANY A ZONING BOARD OF APPEALS APPLICATION)
LOCATED IN ARLINGTON, MA
SEPTEMBER 19, 2022 - REVISED APRIL 14, 2023



LOCUS CONTEXT MAP
(SCALE 1"=100')

PREPARED BY:
PATRIOT Engineering
35 BEDFORD STREET, SUITE 4
LEXINGTON, MASSACHUSETTS 02420
T: (978) 726-2654
www.patriot-eng.com

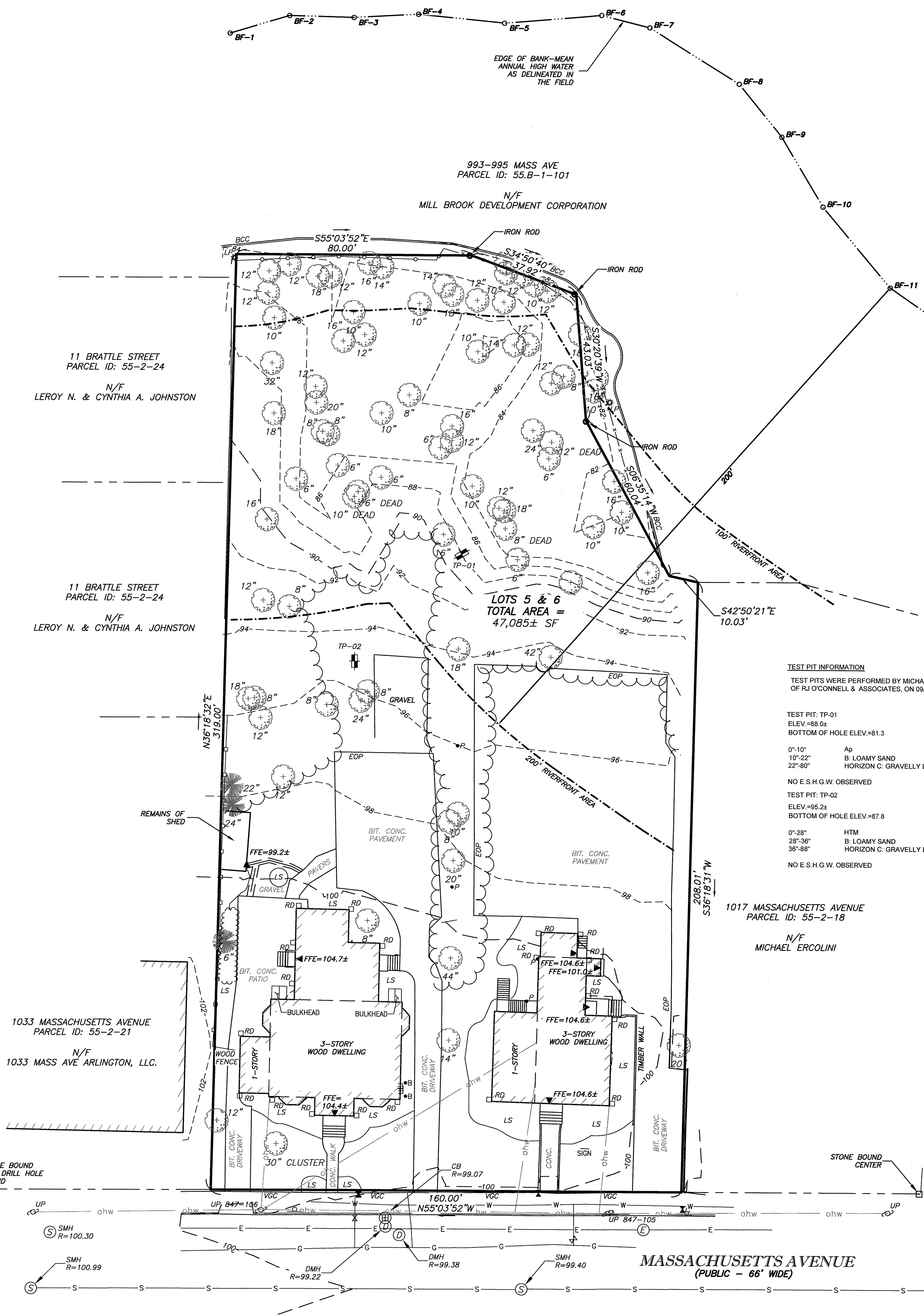


SHEET INDEX

1.	COVER SHEET
2.	EXISTING CONDITIONS PLAN
3.	SITE DEMOLITION PLAN
4.	SITE LAYOUT AND MATERIALS PLAN
5.	EROSION CONTROL/ CONSTRUCTION STORMWATER PLAN
6.	SITE GRADING AND DRAINAGE PLAN
7.	SITE UTILITY PLAN
8.	EMERGENCY ACCESS PLAN
9.	SITE DETAILS - I
10.	SITE DETAILS - II

APPLICANT:
1025 MASS AVE. LLC
13 WHEELING AVENUE
WOBURN, MA 01801

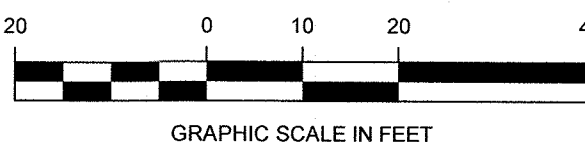
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LEGEND			
(NOT ALL FEATURES CONTAINED IN THIS LEGEND APPEAR ON THE PLAN)			
---	BOUNDARY LINE	CC	CONCRETE CURB
---	ABUTTING PROPERTY LINE	VGC	VERTICAL GRANITE CURB
---		BCB	BITUMINOUS CONCRETE CURB
S	SEWER SERVICE	HC	HANDICAP
D	DRAIN SERVICE	HPDE	HIGH DENSITY POLYETHYLENE
W	WATER SERVICE	CONC.	CONCRETE
G	GAS LINE	LSA	LANDSCAPE AREA
E	ELECTRIC LINE		DOOR
T	TELEPHONE LINE		SIGN
ohw	OVERHEAD WIRES		PARKING COUNT / COMPACT NUMBER
X X X X	CHAIN LINK FENCE		DECIDUOUS TREE
100	STOCKADE FENCE		CONIFEROUS TREE
98	INDEX CONTOUR		FROM RECORD PLANS
	INTERMEDIATE CONTOUR		RETAINING WALL
UP	UTILITY POLE		DETECTABLE WARNING PAD
LP	LIGHT POLE		
	ELECTRIC HAND HOLE		
	CABLE MANHOLE		
	SEWER MANHOLE		
	DRAIN MANHOLE		
	CATCH BASIN		
	WATER VALVE		
	FIRE HYDRANT		
SPR	SPRINKLER CONNECTION		
PIV	POST INDICATOR VALVE		
	BOLLARD		
GM	GAS METER		
	GAS VALVE		
RD	ROOF DRAIN		
AD	AREA DRAIN		
ICV	IRRIGATION CONTROL VALVE		
X 114.7	SPOT GRADE		
	TEST PIT		

- NOTES:**
- THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING SITE CONDITIONS, AS THEY EXISTED AT THE TIME OF THE FIELD SURVEY, OF THE LOCUS PARCEL FOR DESIGN PURPOSES. THIS PLAN WAS PREPARED FROM AN ACTUAL SURVEY MADE ON THE GROUND USING TOTAL STATION METHODS BY R. J. O'CONNELL & ASSOCIATES (RJOC).
 - UNDERGROUND UTILITIES SHOWN ARE FROM OBSERVED SURFACE INDICATIONS, SUBSURFACE INDICATIONS, AND COMPILED FROM AVAILABLE RECORD PLANS OF UTILITY COMPANIES AND PUBLIC AGENCIES AND ARE APPROXIMATE ONLY. AS OF THE DATE OF THIS SURVEY, NO INFORMATION REGARDING RECORD UTILITIES HAS BEEN PROVIDED BY ELECTRIC AND GAS PROVIDERS. BEFORE CONSTRUCTION CALL "DIG SAFE" 811.
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 - EDGE OF BANK-MEAN ANNUAL HIGH WATER LINE WAS DELINEATED BY LEC ENVIRONMENTAL CONSULTANTS, INC. ON OCTOBER 15, 2021 AND WAS LOCATED IN THE FIELD BY TOTAL STATION METHODS ON THE SAME DAY BY RJ O'CONNELL & ASSOCIATES.
 - CONTOUR INTERVAL IS TWO FOOT (2').

- PLAN REFERENCES:**
- PLAN BOOK AND PAGES REFERENCE THE MIDDLESEX SOUTH COUNTY REGISTRY OF DEEDS
- PLAN BOOK 21 PAGE 6 (1864)
 - LAND COURT PLAN 31556a (1962)
 - PLAN 1006 OR 1967
 - LAND COURT PLAN 35170 (1970)
 - PLAN 1158 OF 1986
 - PLAN 586 OF 2015



RJOC

DATE	
REVISION	
NO.	

Record Owner:
1021 MASSACHUSETTS AVENUE
JOHN H. CHAGLIASSIAN
1021 ARLINGTON, MA 02476
BK 72517 / PG 224

1025 - 1027 MASSACHUSETTS AVENUE
STEPHEN B. GERSH
21 KING'S COURT
ESSEX, MA 01929
BK 57869 / PG 298

Location:
PARCEL ID:
1021 MASSACHUSETTS AVENUE
MAP 055 BLOCK 002 LOT 019
1025 - 1027 MASSACHUSETTS AVENUE
MAP 055 BLOCK 002 LOT 020
ARLINGTON, MA

PREPARED BY:
RJOC
& ASSOCIATES, INC.
CIVIL ENGINEERS, SURVEYORS & LAND PLANNERS
80 MONTVALE AVENUE, SUITE 201 STONEHAM, MA 02180
PHONE: 781.279.0180 RJOC@RJOC.COM

PREPARED FOR:
1025 MASS AVE LLC
13 WHEELING AVENUE
WOBBURN, MA 01801

PROJECT NAME:
1021 & 1025 MASSACHUSETTS AVE
ARLINGTON, MA

THIS PLAN IS THE RESULT OF AN ON THE GROUND SURVEY PERFORMED BETWEEN 08/13/2021 AND 10/15/2021.

PROFESSIONAL LAND SURVEYOR FOR
RJ O'CONNELL & ASSOCIATES, INC.

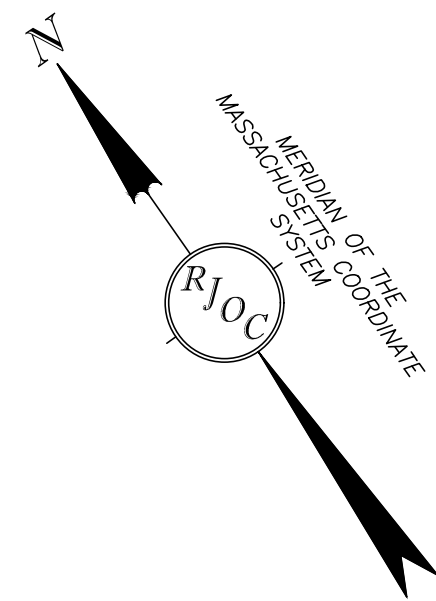
DRAWN BY: RJK / VJH
REVIEWED BY: ML
SCALE: 1" = 20'
FIELD CREW: RJK / CJR
FIELD BOOK: FIELD BOOK 40 / PG 5
DATE: 12/09/2021
DRAWING NAME:

EXISTING CONDITIONS PLAN

DRAWING NUMBER:
2 OF 7

PROJECT NUMBER:
21583

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NOTES:

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LEGEND

(NOT ALL FEATURES CONTAINED IN THIS LEGEND APPEAR ON THE PLAN)

BOUNDARY LINE	
---	ABUTTING PROPERTY LINE
---	SEWER SERVICE
---	DRAIN SERVICE
---	WATER SERVICE
---	GAS LINE
---	ELECTRIC LINE
---	TELEPHONE LINE
---	OVERHEAD WIRES
---	CHAIN LINK FENCE
---	STOCKADE FENCE
UTILITY POLE	CC CONCRETE CURB
LIGHT POLE	VGC VERTICAL GRANITE CURB
ELECTRIC HAND HOLE	BCB BITUMINOUS CONCRETE CURB
CABLE MANHOLE	ADA AMERICANS WITH DISABILITIES ACCESSIBLE
SEWER MANHOLE	HPDE HIGH DENSITY POLYETHYLENE
DRAIN MANHOLE	CONC. CONCRETE
CATCH BASIN	LSA LANDSCAPE AREA
WATER VALVE	DOOR
FIRE HYDRANT	SIGN
SPRINKLER CONNECTION	PARKING COUNT / COMPACT NUMBER
POST INDICATOR VALVE	DECIDUOUS TREE
BOLLARD	CONIFEROUS TREE
GAS METER	FROM RECORD PLANS
GAS VALVE	RETAINING WALL
ROOF DRAIN	DETECTABLE WARNING PAD
AREA DRAIN	
IRRIGATION CONTROL VALVE	
SPOT GRADE	
TEST PIT	
PTBR	PROPOSED TO BE REMOVED
PROPOSED FILTERMITT	
EXISTING TREE PROPOSED TO BE REMOVED	

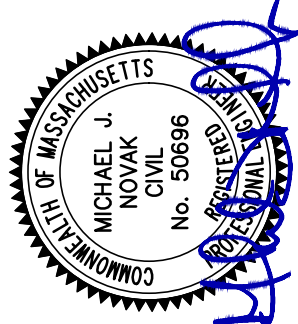
FOR EROSION CONTROL
MEASURES SEE SHEET 5

79 EXISTING TREES TO BE REMOVED

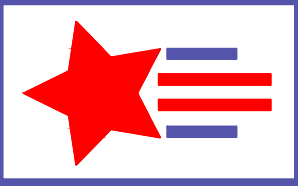
PERMITTING SET

1021 & 1025 MASSACHUSETTS AVENUE
ARLINGTON, MASSACHUSETTS

REVISIONS	
DATE	DESCRIPTION
01-23-2023	BY JBI PEER REVIEW COMMENTS
04-14-2023	BY JBI ZBA AND CONSERVATION COMMENTS

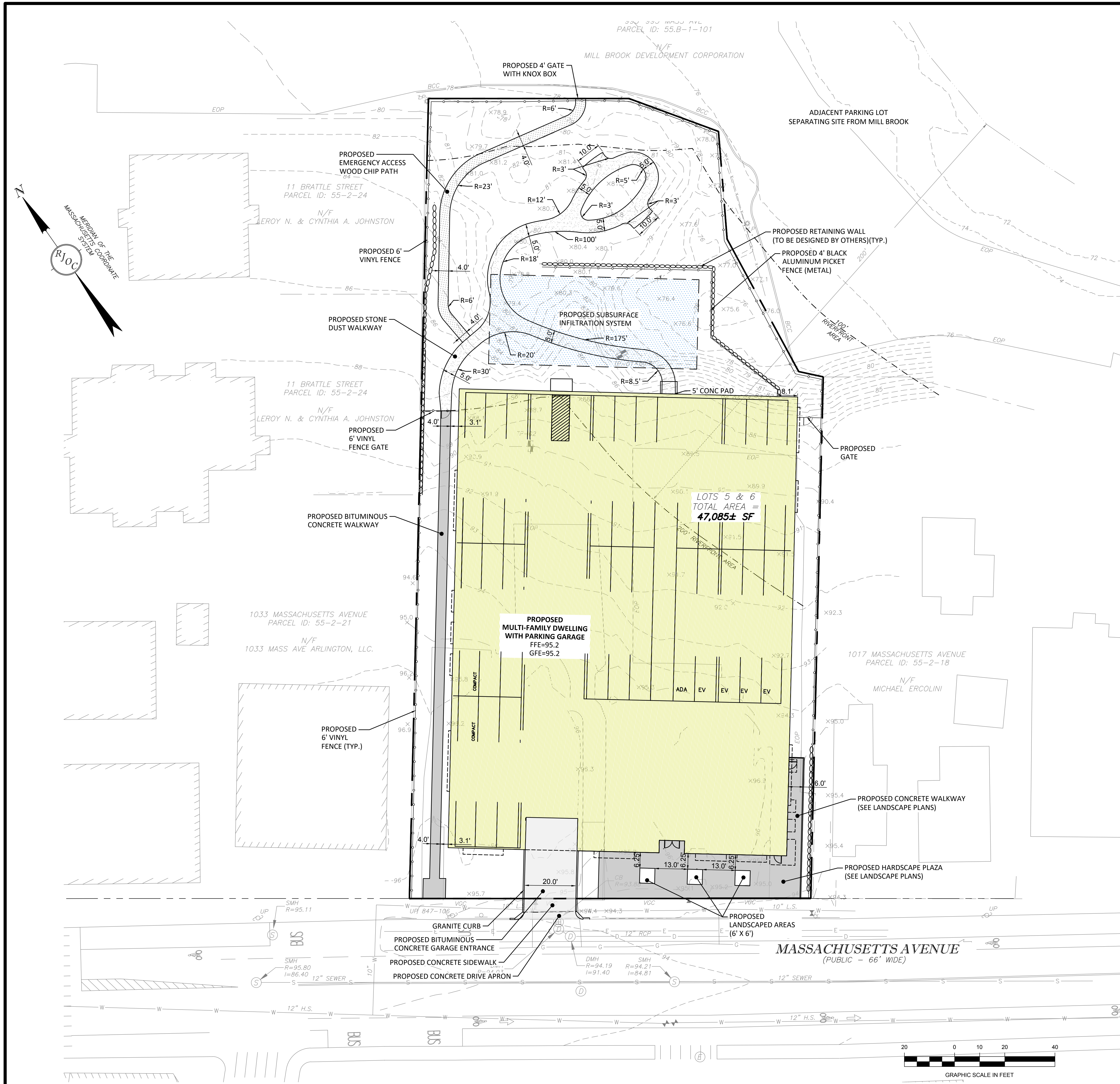


PATRIOT Engineering
35 BEDFORD STREET, SUITE 4
LEXINGTON, MASSACHUSETTS 02420
T: (978) 726-2654
www.patriot-eng.com



SITE DEMOLITION PLAN
LOCATED IN
ARLINGTON, MA
(MIDDLESEX COUNTY)
PREPARED FOR
1025 MASS AVE., LLC

SHEET
3 OF 10



NOTES:

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LEGEND

(NOT ALL FEATURES CONTAINED IN THIS LEGEND APPEAR ON THE PLAN)

		BOUNDARY LINE
		ABUTTING PROPERTY LINE
		SEWER SERVICE
		DRAIN SERVICE
		WATER SERVICE
		GAS LINE
		ELECTRIC LINE
		TELEPHONE LINE
		OVERHEAD WIRES
		CHAIN LINK FENCE
		STOCKADE FENCE
		INDEX CONTOUR
		INTERMEDIATE CONTOUR
		UTILITY POLE
		LIGHT POLE
		ELECTRIC HAND HOLE
		CABLE MANHOLE
		SEWER MANHOLE
		DRAIN MANHOLE
		CATCH BASIN
		WATER VALVE
		FIRE HYDRANT
		SPRINKLER CONNECTION
		POST INDICATOR VALVE
		BOLLARD
		GAS METER
		GAS VALVE
		ROOF DRAIN
		AREA DRAIN
		IRRIGATION CONTROL VALVE
		SPOT GRADE
		TEST PIT
		PROPOSED SUBSURFACE INFILTRATION SYSTEM
		PROPOSED FILTERMITT
		TYPICAL
		PROPOSED FLARED END
		INVERT
		CONCRETE CURB
		VERTICAL GRANITE CURB
		BITUMINOUS CONCRETE CURB
		AMERICANS WITH DISABILITIES ACCESSIBLE
		HIGH DENSITY POLYETHYLENE
		CONCRETE
		LANDSCAPE AREA
		DOOR
		SIGN
		PARKING COUNT / COMPACT NUMBER
		DECIDUOUS TREE
		CONIFEROUS TREE
		FROM RECORD PLANS
		RETAINING WALL
		DETECTABLE WARNING PAD
		PROPOSED SPOT GRADE
		PROPOSED CONTOUR
		PROPOSED RETAINING WALL
		TREE PROPOSED TO BE REMOVED
		LIMIT OF RIVERFRONT AREA
		PROPOSED SEWER SERVICE
		PROPOSED WATER SERVICE
		PROPOSED DRAIN LINE

FOR EROSION CONTROL
MEASURES AND LIMIT
OF WORK SEE SHEET 5

FOR ADDITIONAL HARDSCAPE
INFORMATION SEE
LANDSCAPE DESIGN PLANS

1021 & 1025 MASSACHUSETTS AVENUE
ARLINGTON, MASSACHUSETTS

DATE: 09-19-2022
PROJECT NO: 21-32

REVISIONS	DESCRIPTION
DATE	BY
01-23-2023	JB1
02-23-2023	JB1
04-14-2023	JB1

PATRIOT Engineering

35 BEDFORD STREET, SUITE 4
LEXINGTON, MASSACHUSETTS 02420
T: (978) 726-2654
www.patriot-eng.com

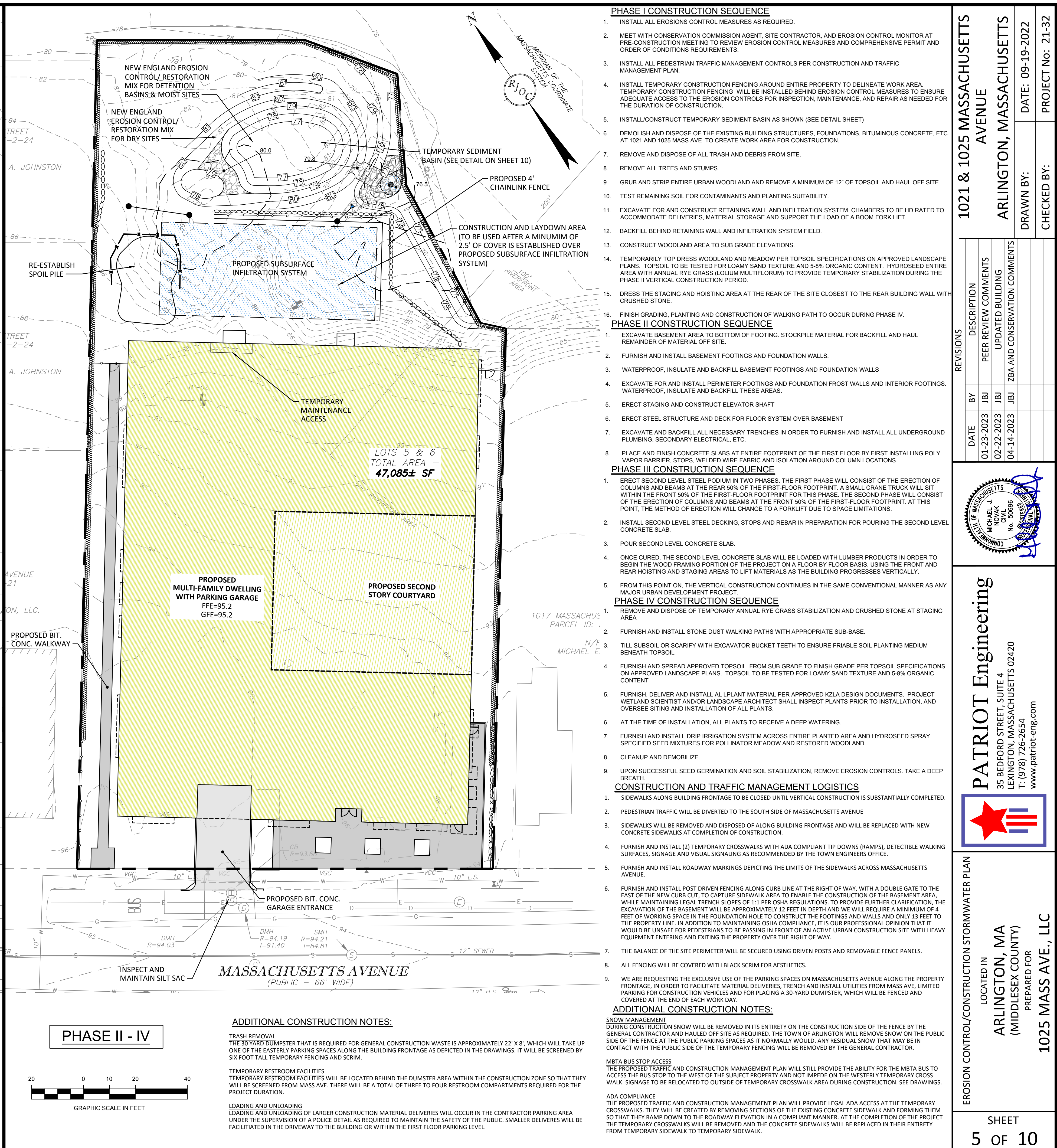
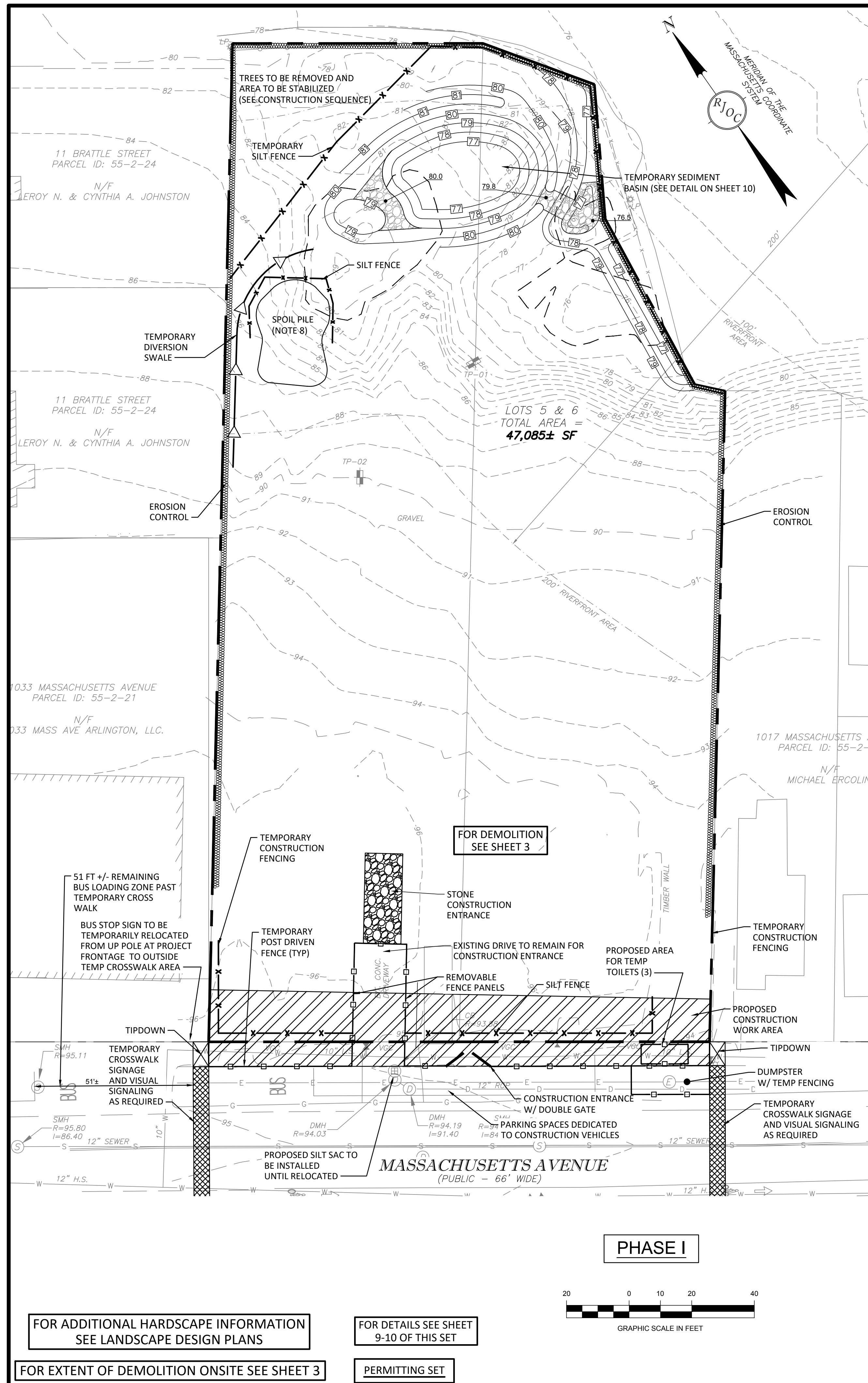
LAYOUT AND MATERIALS PLAN

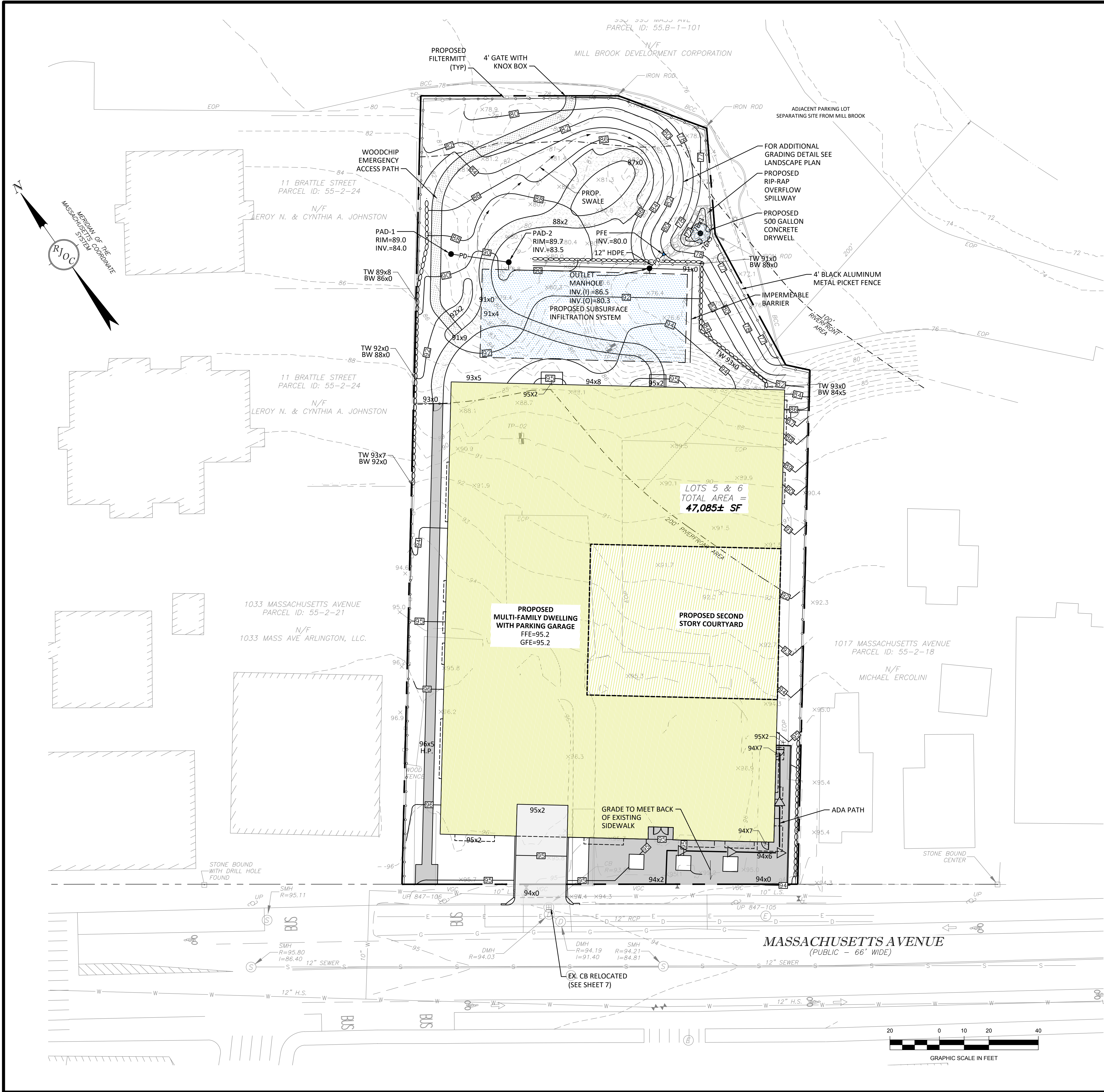
LOCATED IN
ARLINGTON, MA
(MIDDLESEX COUNTY)
PREPARED FOR

1025 MASS AVE., LLC

SHEET

4 OF 10





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LEGEND
(NOT ALL FEATURES CONTAINED IN THIS LEGEND APPEAR ON THE PLAN)

	BOUNDARY LINE		CONCRETE CURB
	ABUTTING PROPERTY LINE		VERTICAL GRANITE CURB
	SEWER SERVICE		BITUMINOUS CONCRETE CURB
	DRAIN SERVICE		HANDICAP
	WATER SERVICE		HIGH DENSITY POLYETHYLENE
	GAS LINE		CONCRETE
	ELECTRIC LINE		LANDSCAPE AREA
	TELEPHONE LINE		DOOR
	OVERHEAD WIRES		SIGN
	CHAIN LINK FENCE		PARKING COUNT / COMPACT NUMBER
	STOCKADE FENCE		DECIDUOUS TREE
	INDEX CONTOUR		CONIFEROUS TREE
	INTERMEDIATE CONTOUR		FROM RECORD PLANS
	UTILITY POLE		RETAINING WALL
	LIGHT POLE		DETECTABLE WARNING PAD
	ELECTRIC HAND HOLE		PROPOSED SPOT GRADE
	CABLE MANHOLE		PROPOSED CONTOUR
	SEWER MANHOLE		PROPOSED RETAINING WALL
	DRAIN MANHOLE		TREE PROPOSED TO BE REMOVED
	CATCH BASIN		LIMIT OF RIVERFRONT AREA
	WATER VALVE		PROPOSED SEWER SERVICE
	FIRE HYDRANT		PROPOSED WATER SERVICE
	SPRINKLER CONNECTION		PROPOSED DRAIN LINE
	POST INDICATOR VALVE		PROPOSED SWALE
	BOLLARD		PROPOSED FLOW ARROW
	GAS METER		
	GAS VALVE		
	ROOF DRAIN		
	AREA DRAIN		
	IRRIGATION CONTROL VALVE		
	SPOT GRADE		
	TEST PIT		
	PROPOSED SUBSURFACE INFILTRATION SYSTEM		
	PROPOSED FILTERMITT		
	TYPICAL		
	PROPOSED FLARED END		
	INVERT		
	TOP OF WALL		
	BOTTOM OF WALL		

PROJECT SUMMARY	
SITE AREA	47,085 S.F.
NUMBER OF HOUSING UNITS	50 UNITS
PERCENT COVERAGE	
BUILDING COVERAGE	53%
USEABLE OPEN SPACE	46%
PARKING AND PAVED AREA	1%
UN-USEABLE OPEN SPACE	0%
TOTAL COVERAGE	100%
PARKING SUMMARY	
TOTAL PARKING SPACES	53 SPACES
PARKING RATIO (SPACES PER UNIT)	1.1

PROPOSED RETAINING WALLS SHOWN HEREON TO BE DESIGNED BY OTHERS

PERMITTING SET

1021 & 1025 MASSACHUSETTS AVENUE
ARLINGTON, MASSACHUSETTS

DATE: 09-19-2022
PROJECT NO: 21-32

REVISIONS	DATE	BY	DESCRIPTION
	01-23-2023	JB1	PERMIT SET
	02-22-2023	JB1	UPDATED BUILDING
	04-14-2023	JB1	ZBA AND CONSERVATION COMMENTS

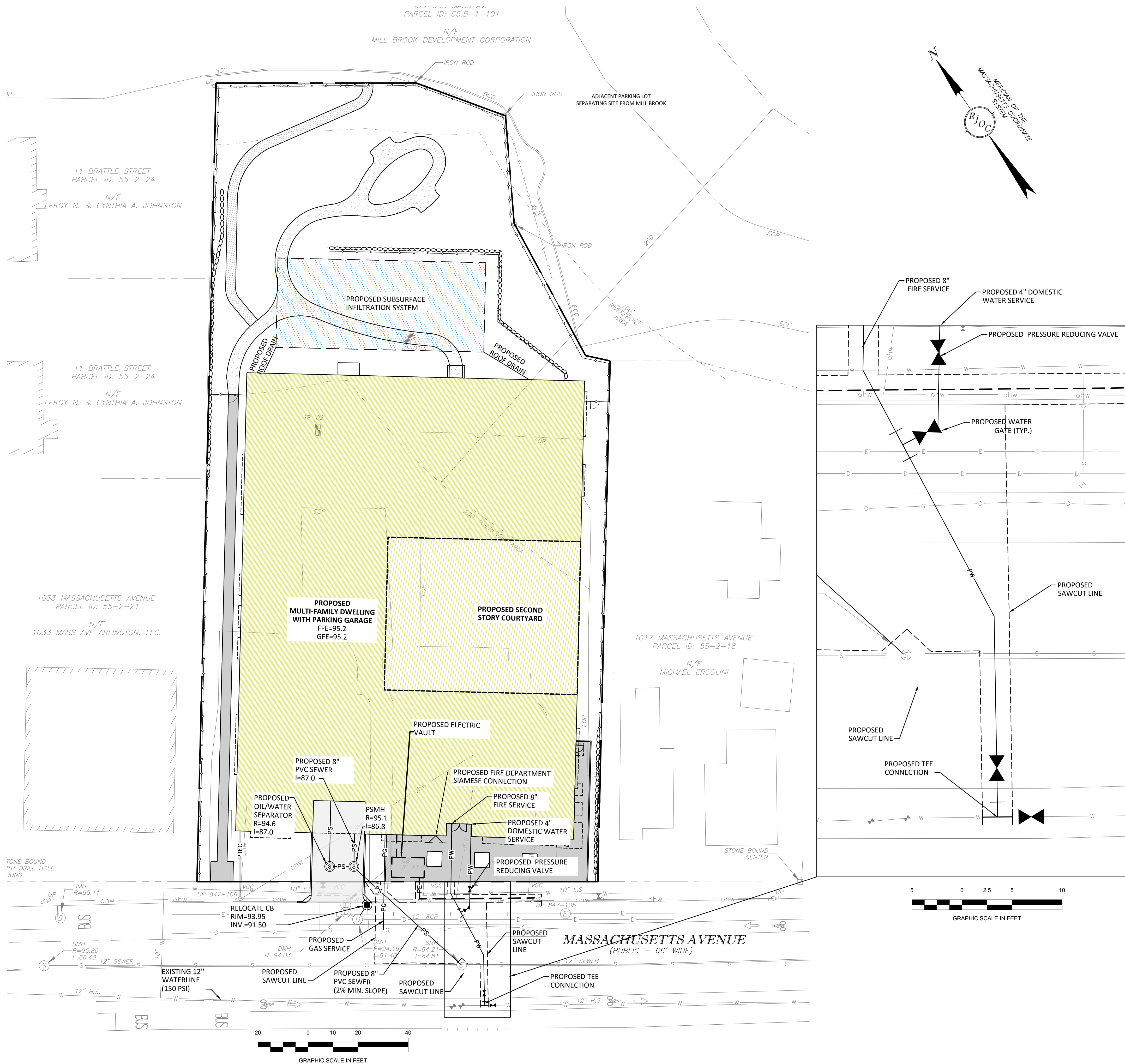
PATRIOT Engineering
35 BEDFORD STREET, SUITE 4
LEXINGTON, MASSACHUSETTS 02420
T: (978) 726-2654
www.patriot-eng.com

SITE GRADING AND DRAINAGE PLAN
LOCATED IN
ARLINGTON, MA
(MIDDLESEX COUNTY)
PREPARED FOR

1025 MASS AVE., LLC

SHEET
6 OF 10

PERMITTING SET



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 - CONTOUR INTERVAL IS TWO FOOT (2').
 - ALL EXISTING UTILITIES ARE REQUIRED TO BE CUT AND CAPPED AT THE EXISTING MAIN CONNECTIONS.

- UTILITY NOTES:**
- ALL EXISTING UTILITIES ARE REQUIRED TO BE CUT AND CAPPED AT THE EXISTING MAIN CONNECTIONS.
 - ALL PROPOSED WATER AND SEWER PIPING SHALL BE SEPARATED BY 10 FEET HORIZONTALLY AND/OR 18 INCHES VERTICALLY (WATER OVER SEWER).
 - PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS (BOTH VERTICALLY OR HORIZONTALLY) TO CONFIRM ALL PROPOSED UTILITY CONNECTIONS WILL MEET ALL TOWN REQUIREMENTS AND FUNCTION AS DESIGNED.

LEGEND
(NOT ALL FEATURES CONTAINED IN THIS LEGEND APPEAR ON THE PLAN)

--- S --- S ---	BOUNDARY LINE
--- D --- D ---	ABUTTING PROPERTY LINE
--- W --- W ---	SEWER SERVICE
--- G --- G ---	DRAIN SERVICE
--- E --- E ---	WATER SERVICE
--- T --- T ---	GAS LINE
ohw ohw	ELECTRIC LINE
X X X X	TELEPHONE LINE
---	OVERHEAD WIRES
---	CHAIN LINK FENCE
---	STOCKADE FENCE
---	INDEX CONTOUR
---	INTERMEDIATE CONTOUR
CC	CONCRETE CURB
VGC	VERTICAL GRANITE CURB
BCB	BITUMINOUS CONCRETE CURB
HC	HANDICAP
HPDE	HIGH DENSITY POLYETHYLENE
CONC.	CONCRETE
LSA	LANDSCAPE AREA
---	DOOR
---	SIGN
(REC)	FROM RECORD PLANS
---	RETAINING WALL
---	DETECTABLE WARNING PAD
---	PROPOSED RETAINING WALL
PTEC	PROPOSED TELEPHONE/ELECTRIC/CABLE
---	LIMIT OF RIVERFRONT AREA
PS	PROPOSED SEWER SERVICE
PW	PROPOSED WATER SERVICE
PD	PROPOSED DRAIN LINE
---	PROPOSED WATER GATE
PG	PROPOSED GAS LINE
PE	PROPOSED ELECTRIC LINE
---	PROPOSED SEWER MANHOLE (PSMH)

UTILITY POLE
LIGHT POLE
ELECTRIC HAND HOLE
CABLE MANHOLE
SEWER MANHOLE
DRAIN MANHOLE
CATCH BASIN
WATER VALVE
FIRE HYDRANT
SPRINKLER CONNECTION
POST INDICATOR VALVE
BOLLARD
GAS METER
GAS VALVE
ROOF DRAIN
AREA DRAIN
IRRIGATION CONTROL VALVE
SPOT GRADE
TEST PIT
PSIS
PROPOSED SUBSURFACE INFILTRATION SYSTEM
PROPOSED FILTERMITT
TYP
PFE
INV.

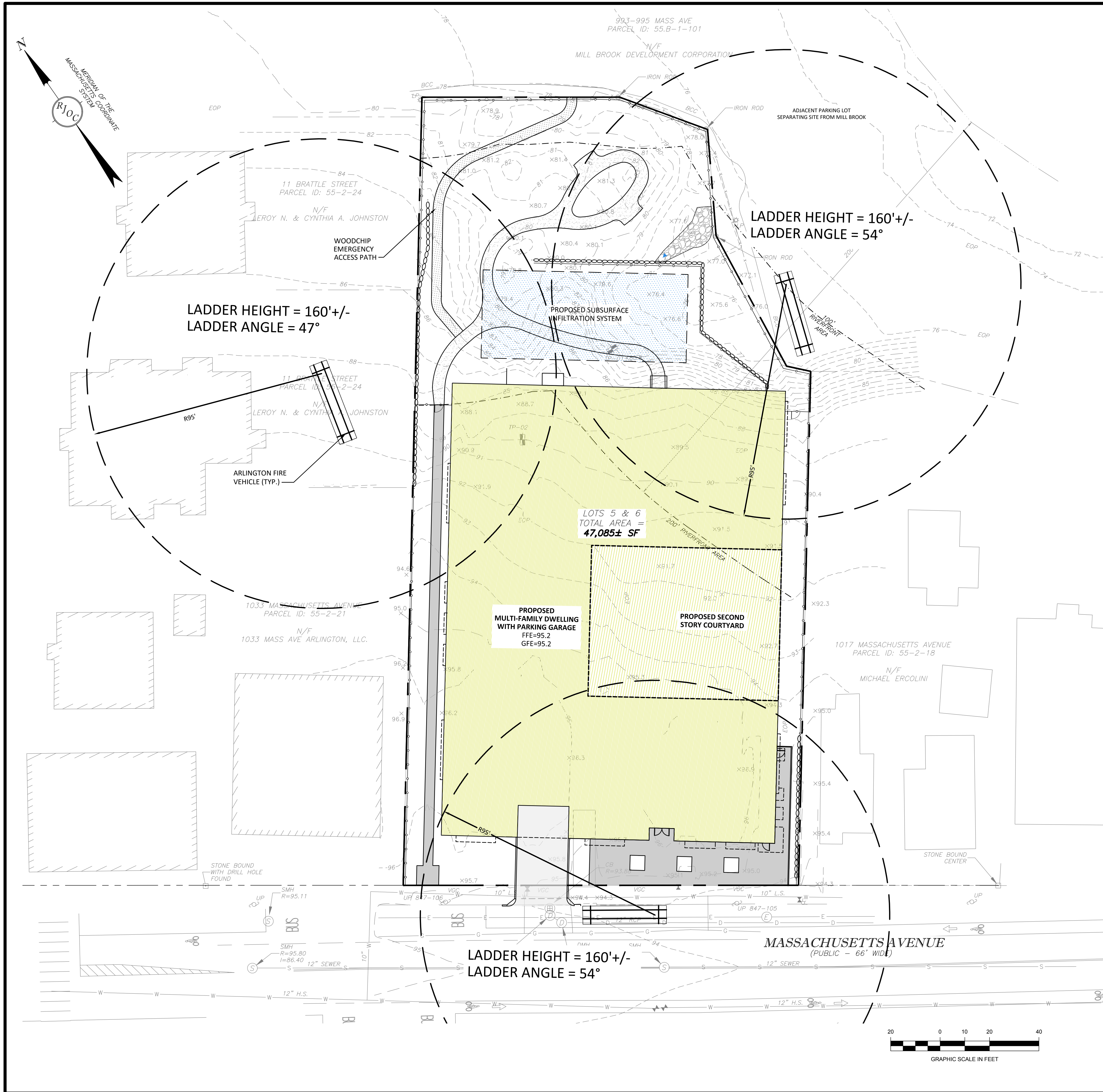
PROPOSED 8" FIRE SERVICE
PROPOSED 4" DOMESTIC WATER SERVICE
PROPOSED PRESSURE REDUCING VALVE
PROPOSED WATER GATE (TYP.)
PROPOSED SAWCUT LINE
PROPOSED TEE CONNECTION

SEWER INFORMATION:

- TOTAL FLOW FROM PROPOSED BUILDING:
97 BEDS X 110 GPD/BED X 1.15 = 12,670 GPD
12,670 GPD = 0.02 CFS
- SEWER SERVICE CAPACITY (HALF FULL):
6" PVC PIPE @ 2% = 0.46 CFS
- SEWER MAIN CAPACITY (HALF FULL):
12" PVC PIPE @ 0.95% = 2.06 CFS

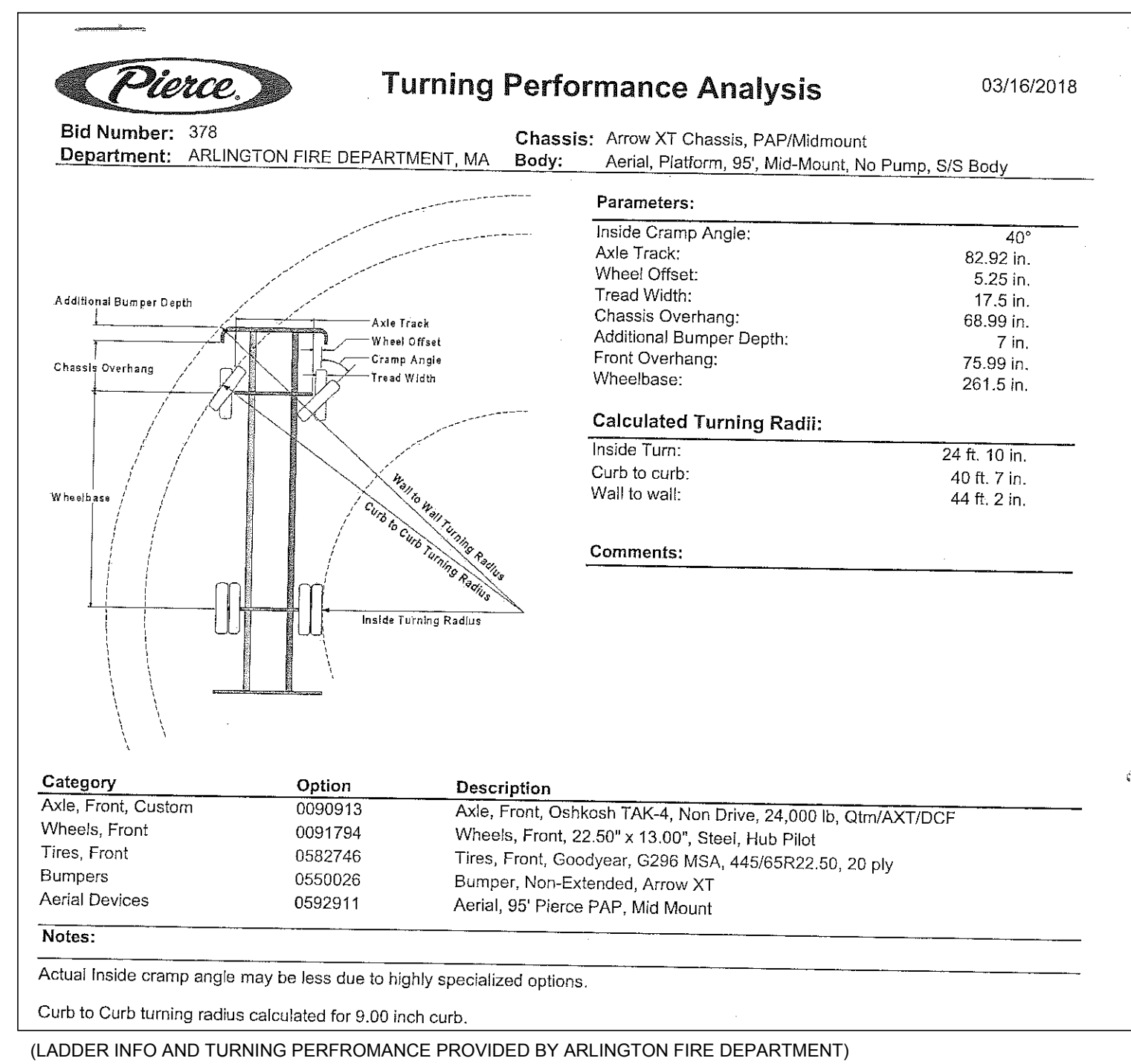
1021 & 1025 MASSACHUSETTS AVENUE ARLINGTON, MASSACHUSETTS	DATE: 09-19-2022	PROJECT No: 21-32
	DRAWN BY: JBI	CHECKED BY: JBI
REVISIONS	DESCRIPTION	
01/23/23	BY JBI	PEER REVIEW COMMENTS
02/22/23	BY JBI	UPDATED BUILDING
03/14/23	BY JBI	ADDRESS COMMENTS / SAW CUT
04-14-2023	BY JBI	ZBA AND CONSERVATION COMMENTS
PATRIOT Engineering 35 BEDFORD STREET, SUITE 4 LEXINGTON, MASSACHUSETTS 02420 T: (978) 726-2654 www.patriot-eng.com		
SITE UTILITY PLAN LOCATED IN ARLINGTON, MA (MIDDLESEX COUNTY) PREPARED FOR 1025 MASS AVE., LLC	SHEET 7 OF 10	

PERMITTING SET



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LEGEND	
(NOT ALL FEATURES CONTAINED IN THIS LEGEND APPEAR ON THE PLAN)	
	BOUNDARY LINE
	ABUTTING PROPERTY LINE
	SEWER SERVICE
	DRAIN SERVICE
	WATER SERVICE
	GAS LINE
	ELECTRIC LINE
	TELEPHONE LINE
	OVERHEAD WIRES
	CHAIN LINK FENCE
	STOCKADE FENCE
	INDEX CONTOUR
	INTERMEDIATE CONTOUR
	UTILITY POLE
	LIGHT POLE
	ELECTRIC HAND HOLE
	CABLE MANHOLE
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	DRAIN MANHOLE
	CATCH BASIN
	WATER VALVE
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	SPRINKLER CONNECTION
	POST INDICATOR VALVE
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	GAS METER
	GAS VALVE
	ROOF DRAIN
	AREA DRAIN
	IRRIGATION CONTROL VALVE
	SPOT GRADE
	TEST PIT
	PROPOSED SUBSURFACE INFILTRATION SYSTEM
	PROPOSED FILTERMITT
	TYPICAL
	PROPOSED FLARED END
	INVERT
	CONCRETE CURB
	VERTICAL GRANITE CURB
	BITUMINOUS CONCRETE CURB
	HANDICAP
	HIGH DENSITY POLYETHYLENE
	CONCRETE
	LANDSCAPE AREA
	DOOR
	SIGN
	PARKING COUNT / COMPACT NUMBER
	DECIDUOUS TREE
	CONIFEROUS TREE
	FROM RECORD PLANS
	RETAINING WALL
	DETECTABLE WARNING PAD
	PROPOSED SPOT GRADE
	PROPOSED CONTOUR
	PROPOSED RETAINING WALL
	TREE PROPOSED TO BE REMOVED
	LIMIT OF RIVERFRONT AREA
	PROPOSED SEWER SERVICE
	PROPOSED WATER SERVICE
	PROPOSED DRAIN LINE



1021 & 1025 MASSACHUSETTS AVENUE
ARLINGTON, MASSACHUSETTS

DATE: 09-19-2022
PROJECT NO: 21-32

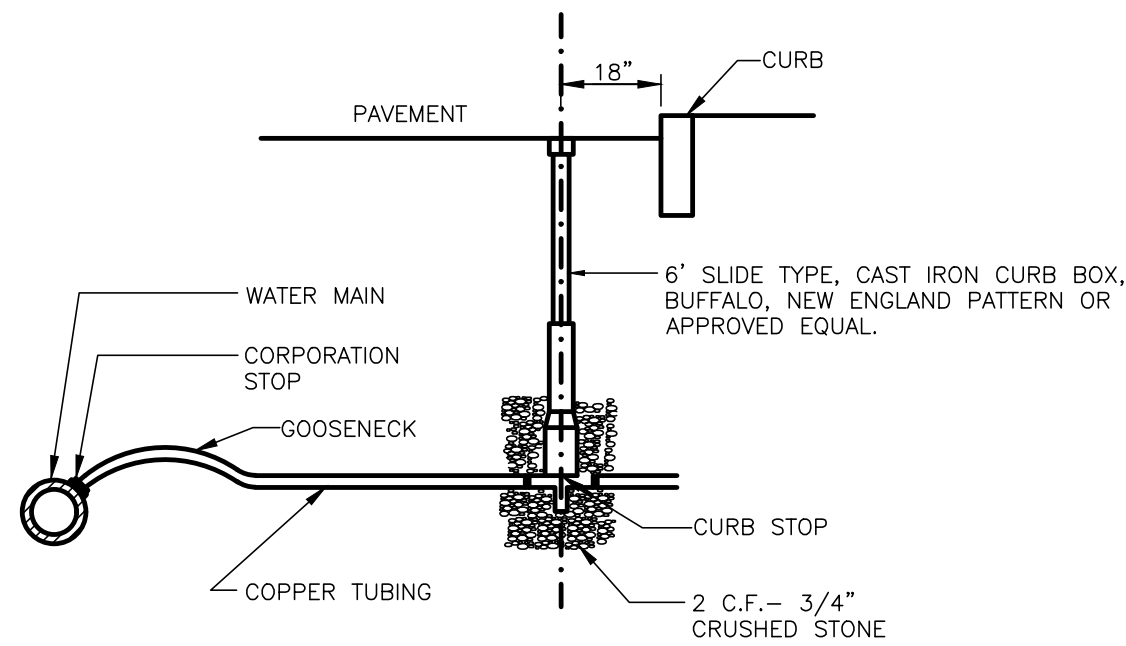
REVISIONS

DATE	BY	REVIEW COMMENTS
01-23-2023	JB1	PEER REVIEW COMMENTS
02-22-2023	JB1	UPDATED BUILDING
04-14-2023	JB1	ZBA AND CONSERVATION COMMENTS

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EMERGENCY ACCESS PLAN
LOCATED IN
ARLINGTON, MA
(MIDDLESEX COUNTY)
PREPARED FOR
1025 MASS AVE., LLC

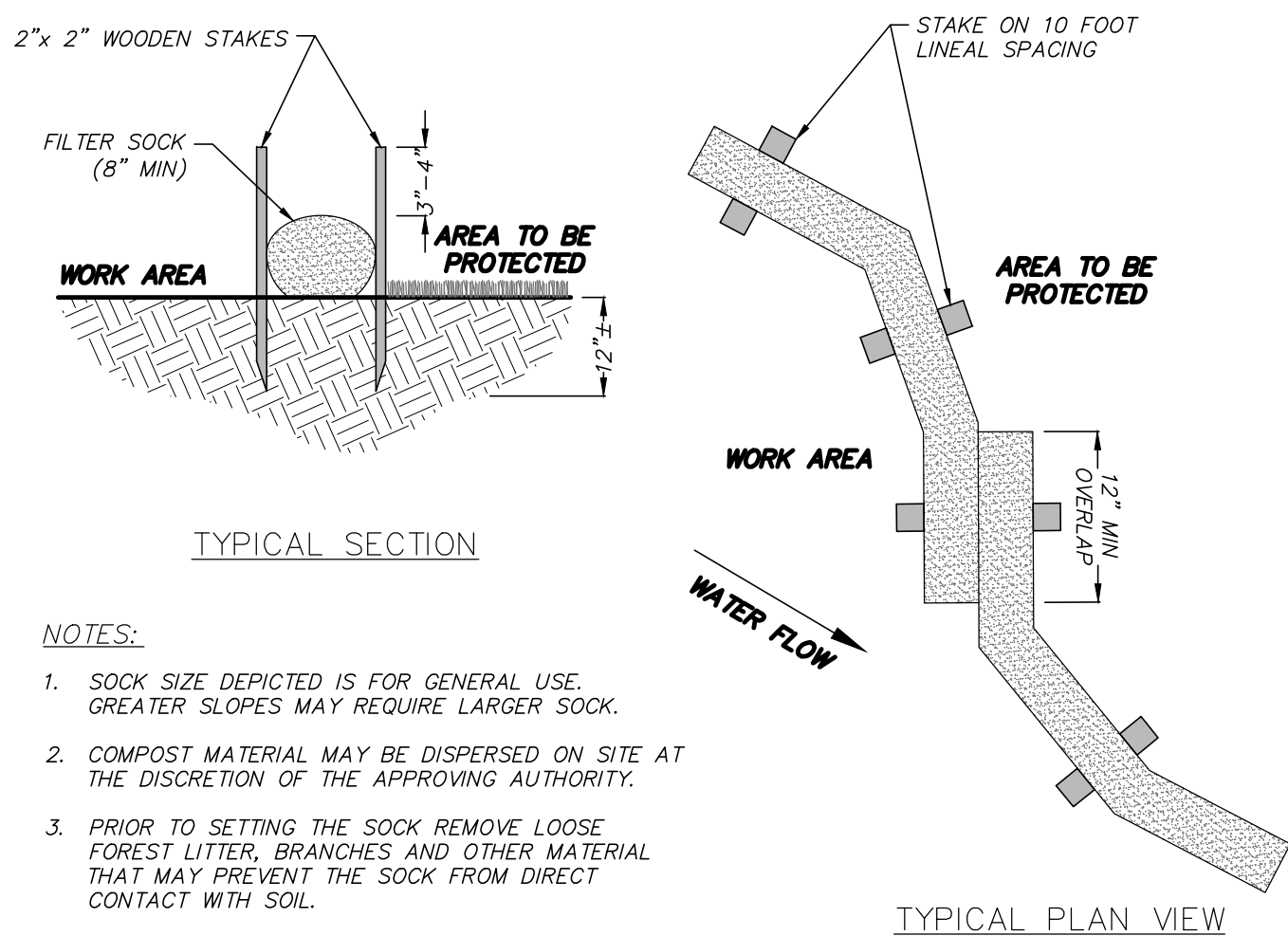
SHEET
8 OF 10



- NOTE:
1. INSTALLATION AND MATERIALS TO BE IN ACCORDANCE WITH TOWN OF NORTH ATTLEBOROUGH'S SPECIFICATIONS.
 2. WATER SERVICES LARGER THAN 1" ARE TO BE RESTRAINED TO MAIN W/ APPROVED SADDLE.

TYPICAL WATER SERVICE CONNECTION DETAIL

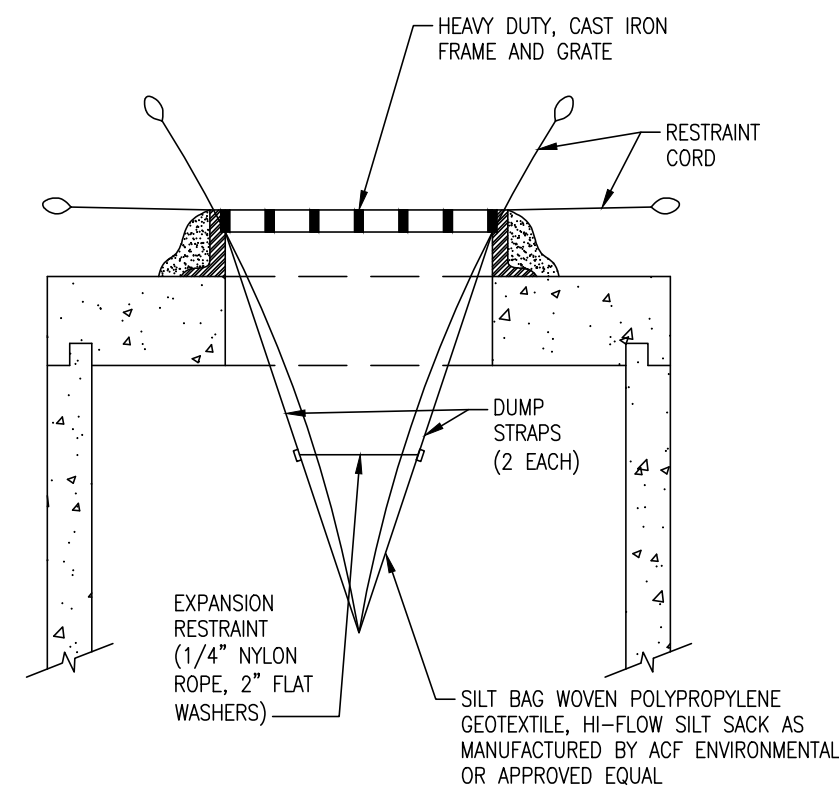
SCALE: N.T.S.



- NOTES:
1. SOCK SIZE DEPICTED IS FOR GENERAL USE. GREATER SLOPES MAY REQUIRE LARGER SOCK.
 2. COMPOST MATERIAL MAY BE DISPERSED ON SITE AT THE DISCRETION OF THE APPROVING AUTHORITY.
 3. PRIOR TO SETTING THE SOCK REMOVE LOOSE FOREST LITTER, BRANCHES AND OTHER MATERIAL THAT MAY PREVENT THE SOCK FROM DIRECT CONTACT WITH SOIL.

COMPOST FILTER SOCK

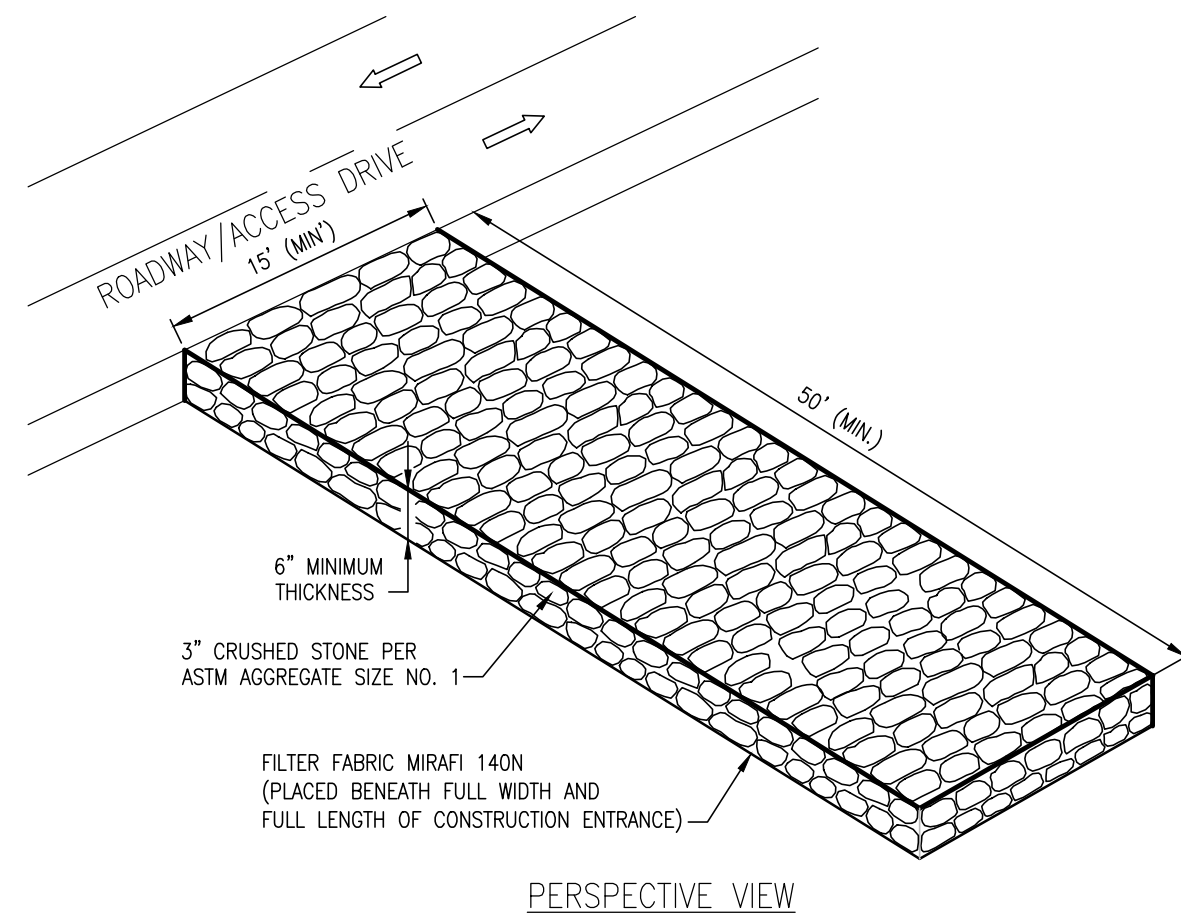
SCALE: N.T.S.



- NOTES:
1. INSTALL SILT BAG IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 2. WHEN EXPANSION RESTRAINT CORD IS NO LONGER VISIBLE, THE SILT BAG IS FULL AND SHOULD BE EMPTIED OR REPLACED.
 3. REMOVE SILT BAG PER MANUFACTURER'S INSTRUCTIONS.

TYPICAL FILTER BAG DETAIL

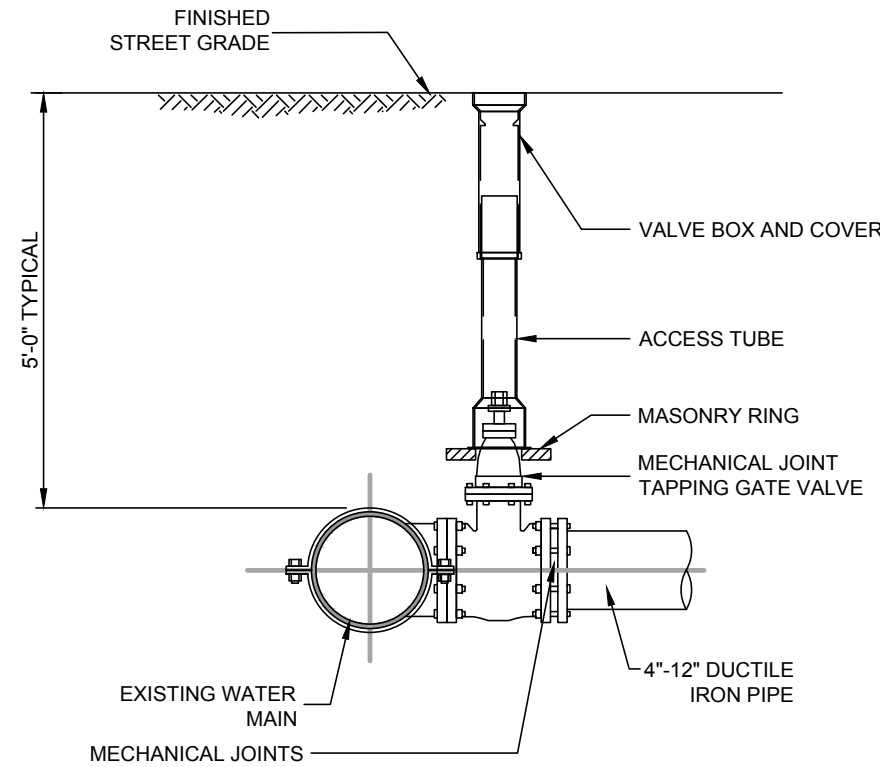
SCALE: N.T.S.



- NOTES:
1. ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY.
 2. WHEN THE ENTRANCE PAD BECOMES INEFFECTIVE, THE STONE SHALL BE REMOVED WITH THE COLLECTED SOIL MATERIAL, REGRADED, STABILIZED AND THE CONSTRUCTION ENTRANCE RECONSTRUCTED.

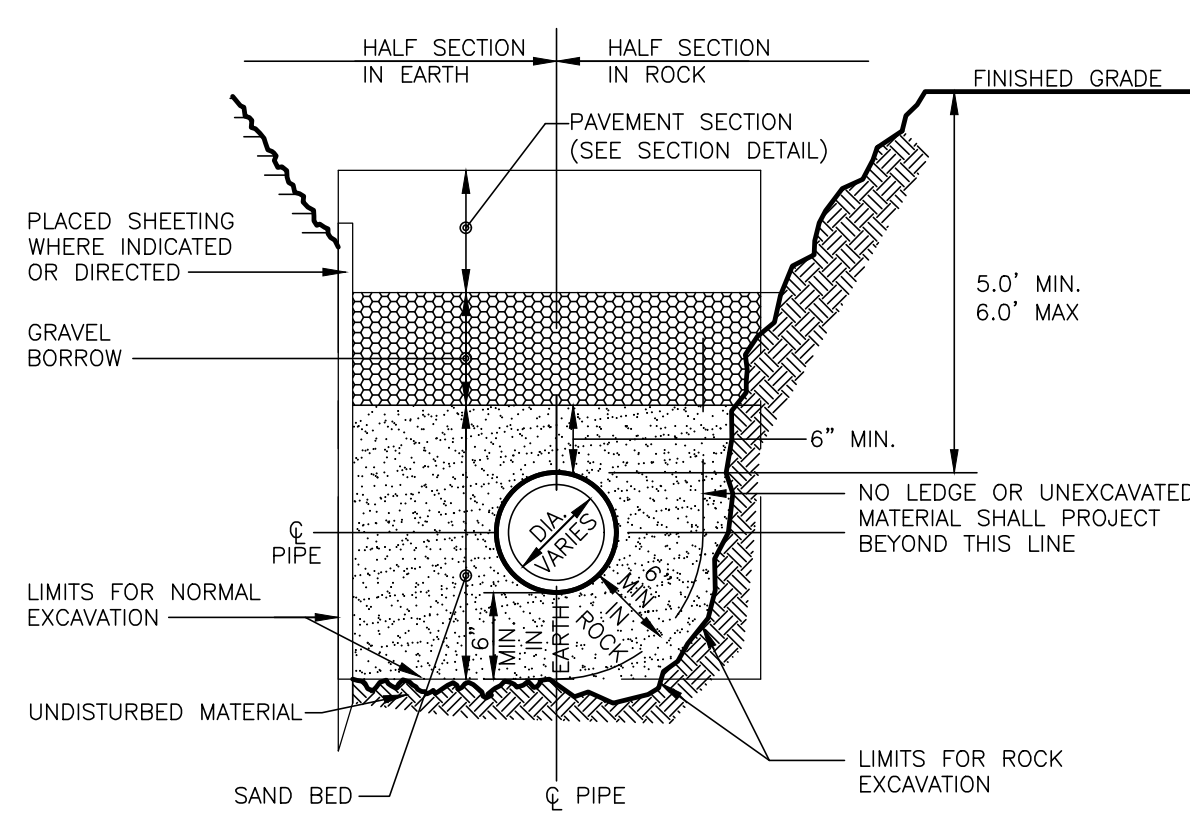
VEHICLE TRACKING PAD DETAIL

SCALE: N.T.S.



TYPICAL GATE VALVE DETAIL

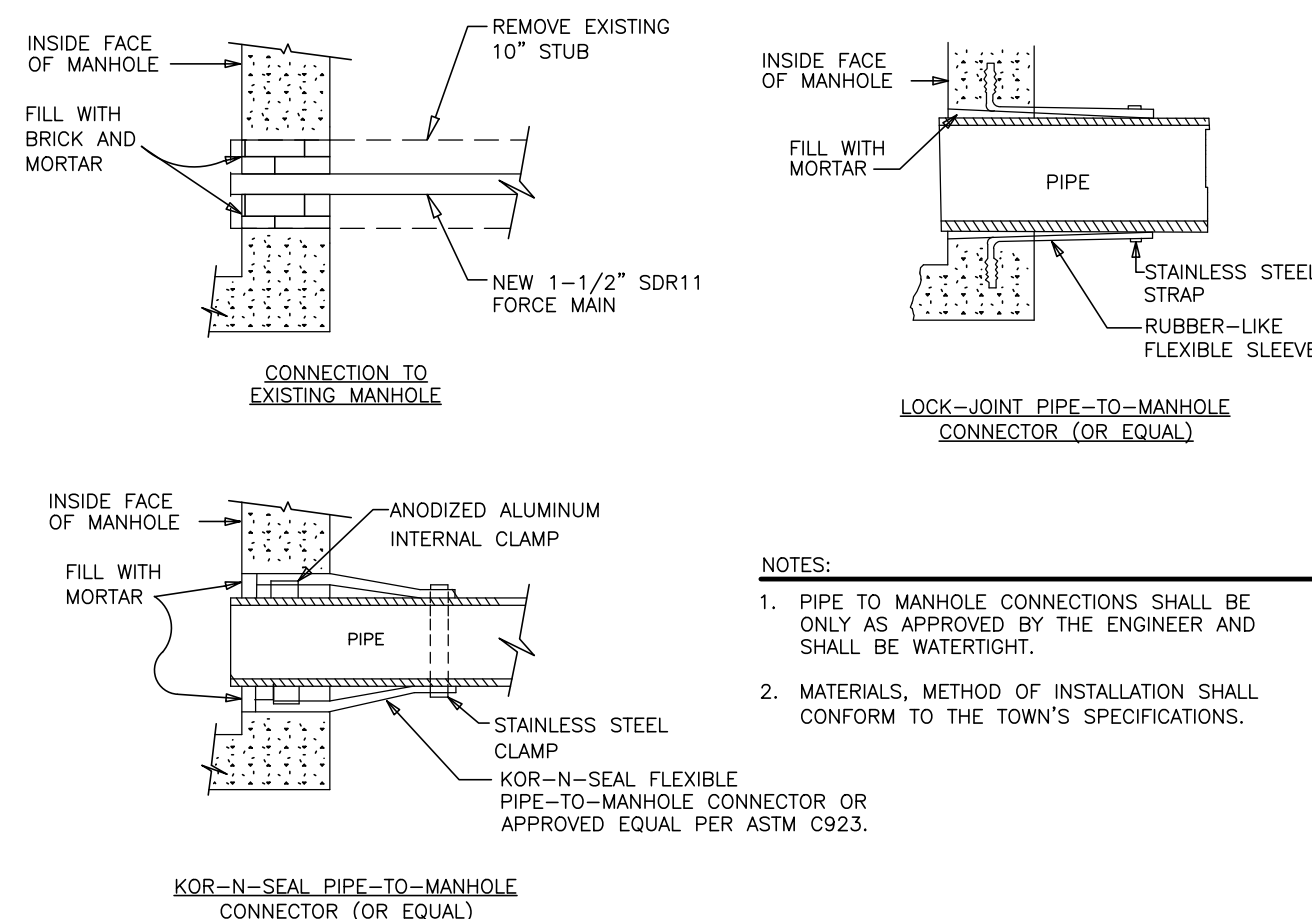
SCALE: N.T.S.



NOTE:
WHERE MORE STRINGENT, CONTRACTOR SHALL COMPLY WITH TOWN'S REQUIREMENTS.

TYPICAL WATER TRENCH DETAIL

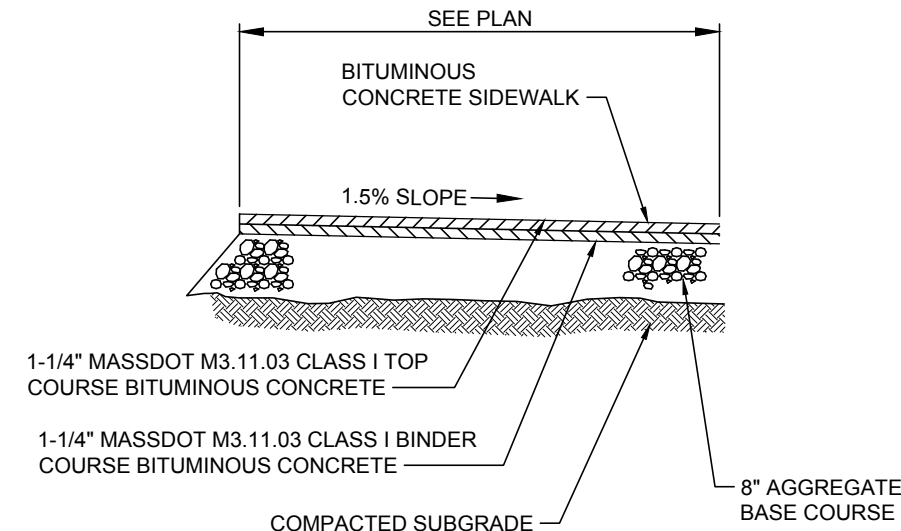
SCALE: N.T.S.



- NOTES:
1. PIPE TO MANHOLE CONNECTIONS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND SHALL BE WATER-TIGHT.
 2. MATERIALS, METHOD OF INSTALLATION SHALL CONFORM TO THE TOWN'S SPECIFICATIONS.

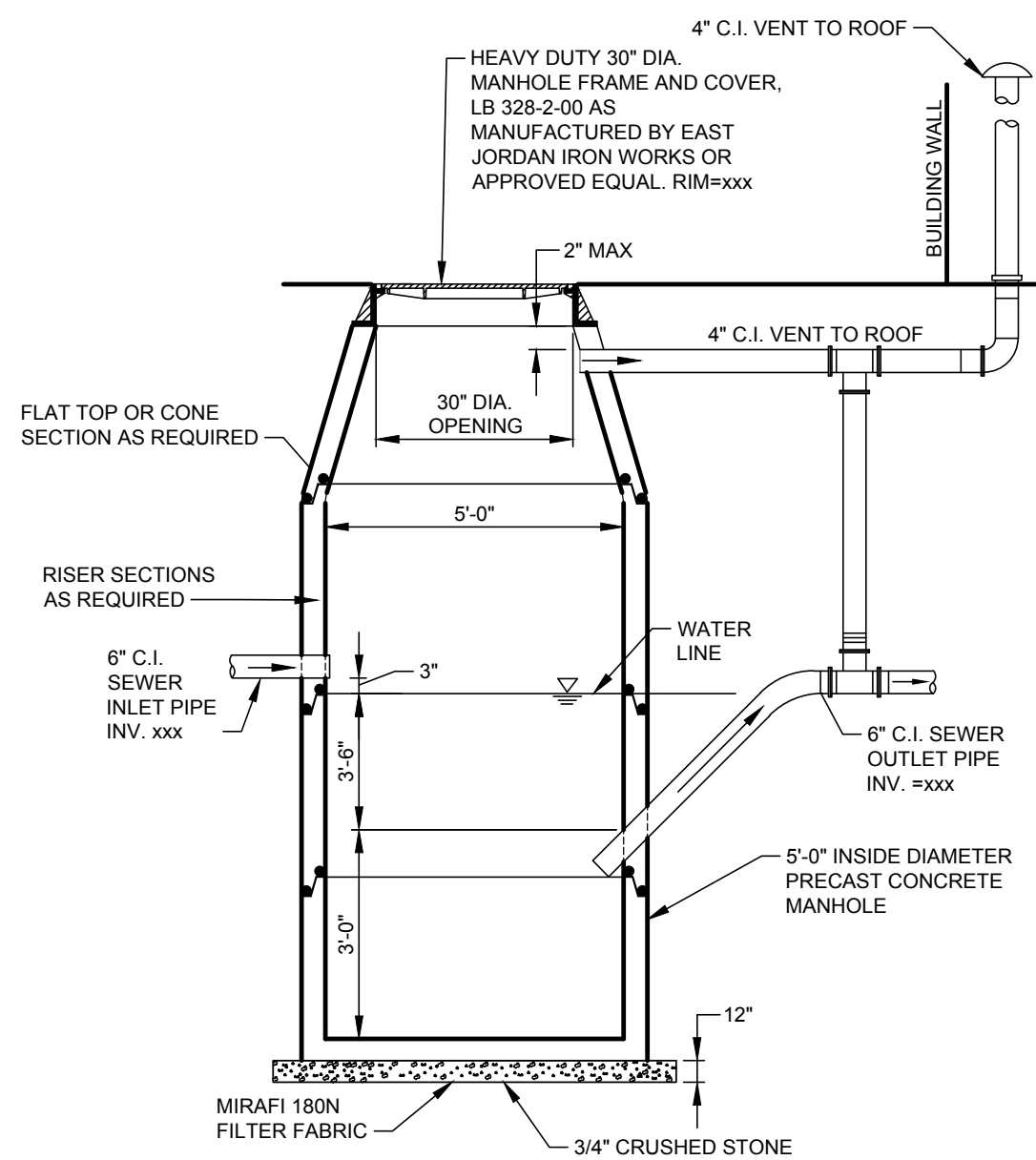
PIPE CONNECTIONS TO SEWER MANHOLE DETAIL

SCALE: N.T.S.



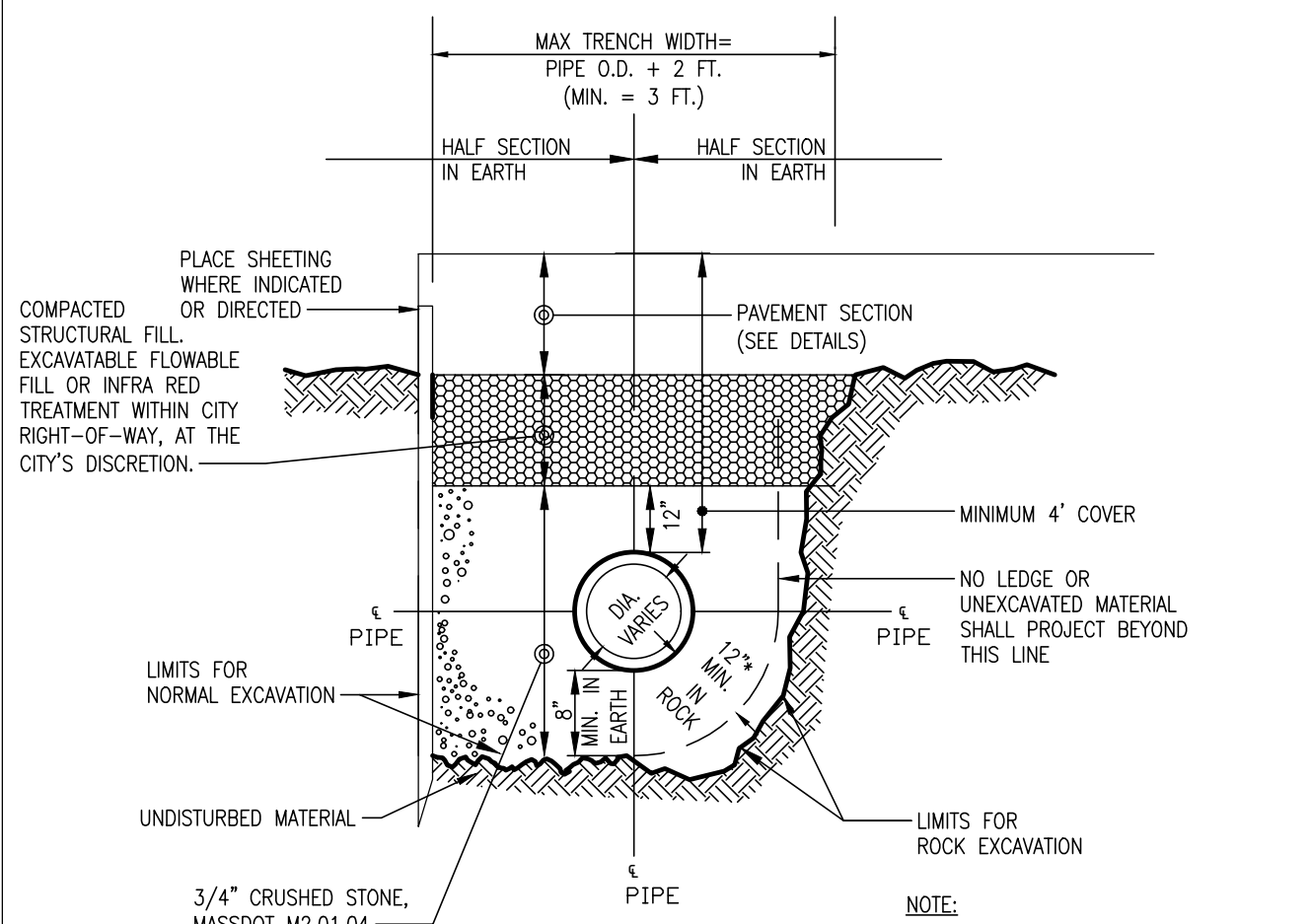
BITUMINOUS SIDEWALK DETAIL

SCALE: N.T.S.



TYPICAL OIL/WATER SEPARATOR DETAIL

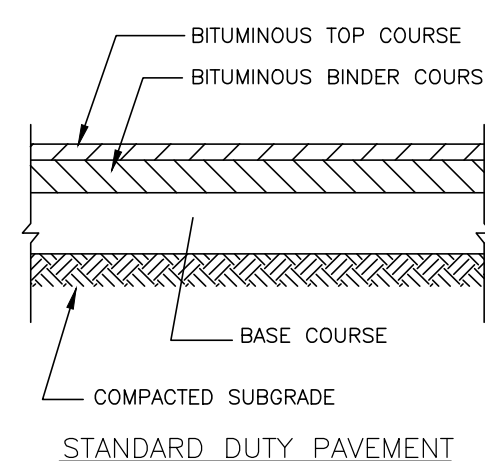
SCALE: N.T.S.



NOTE:
METHODS OF INSTALLATION TO MEET OR EXCEED THE CITY/TOWN WATER/SEWER DEPARTMENT AND PIPE MANUFACTURER'S SPECIFICATIONS.
SEWER PIPE WITH LESS THAN 4 FEET OF COVER MUST BE INSULATED. MIN SEWER COVER SHOULD NOT BE LESS THAN 3 FEET.
* AS PER CITY/TOWN SPECIFICATIONS

TYPICAL SEWER TRENCH DETAIL

SCALE: N.T.S.



STANDARD DUTY PAVEMENT

PAVEMENT LAYER	STANDARD DUTY PAVEMENT
TOP COURSE BITUMINOUS PAVEMENT SECTION M3.11.00	1 INCH
BINDER COURSE BITUMINOUS PAVEMENT SECTION M1.11.00	2 INCHES
BASE COURSE SEE NOTE 3	12 INCHES

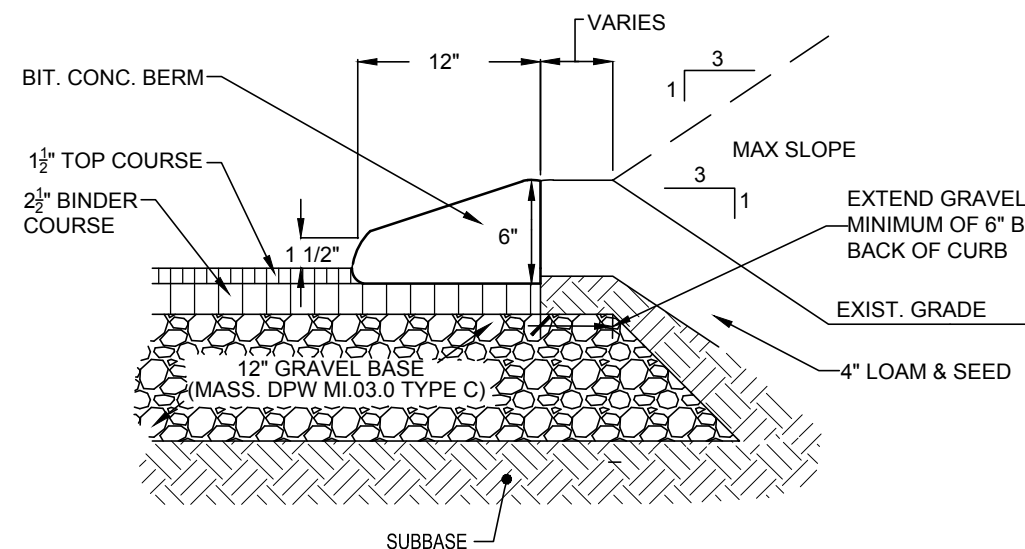
PAVEMENT SECTION TABLE

- NOTES:
1. BITUMINOUS TOP COURSE SHALL MEET MASS DOT ITEM M3.11.00 TABLE A (TOP COURSE)
 2. BITUMINOUS BINDER COURSE SHALL MEET MASS DOT ITEM M3.11.00 TABLE A (BINDER COURSE)
 3. BASE COURSE MATERIAL SHALL BE BASE COURSE SAND AND GRAVEL PER THE SPECIFICATIONS AND/OR RECLAIMED ASPHALT PAVEMENT BORROW MATERIAL PER MASSDOT ITEM M1.11.0. SEE DEMOLITION NOTES 10 AND 11, DWG. N-1.

BITUMINOUS PAVEMENT DETAIL

SCALE: N.T.S.

- NOTE:
1. BITUMINOUS CONCRETE FOR CURBING SHALL BE CLASS I CONFORMING TO THE APPLICABLE REQUIREMENTS FOR DENSE MIX IN SECTION M3.11.03, TABLE A, OF THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
 2. THE BITUMINOUS CONCRETE MIXTURE SHALL BE PLACED AND COMPACTED WITH A MACHINE CAPABLE OF SPREADING THE MIXTURE TRUE TO LINE AND GRADE AND TO THE SHAPE STIPULATED.
 3. IF AT ANY TIME BEFORE ACCEPTANCE OF THE WORK ANY SOFT OR IMPERFECT SPOTS DEVELOP IN THE EXPOSED SURFACE OF THE CURB, THAT PORTION OF THE CURB SHALL BE REMOVED AND REPLACED WITH NEW CURBING AT NO COST TO THE OWNER.



PERMITTING SET

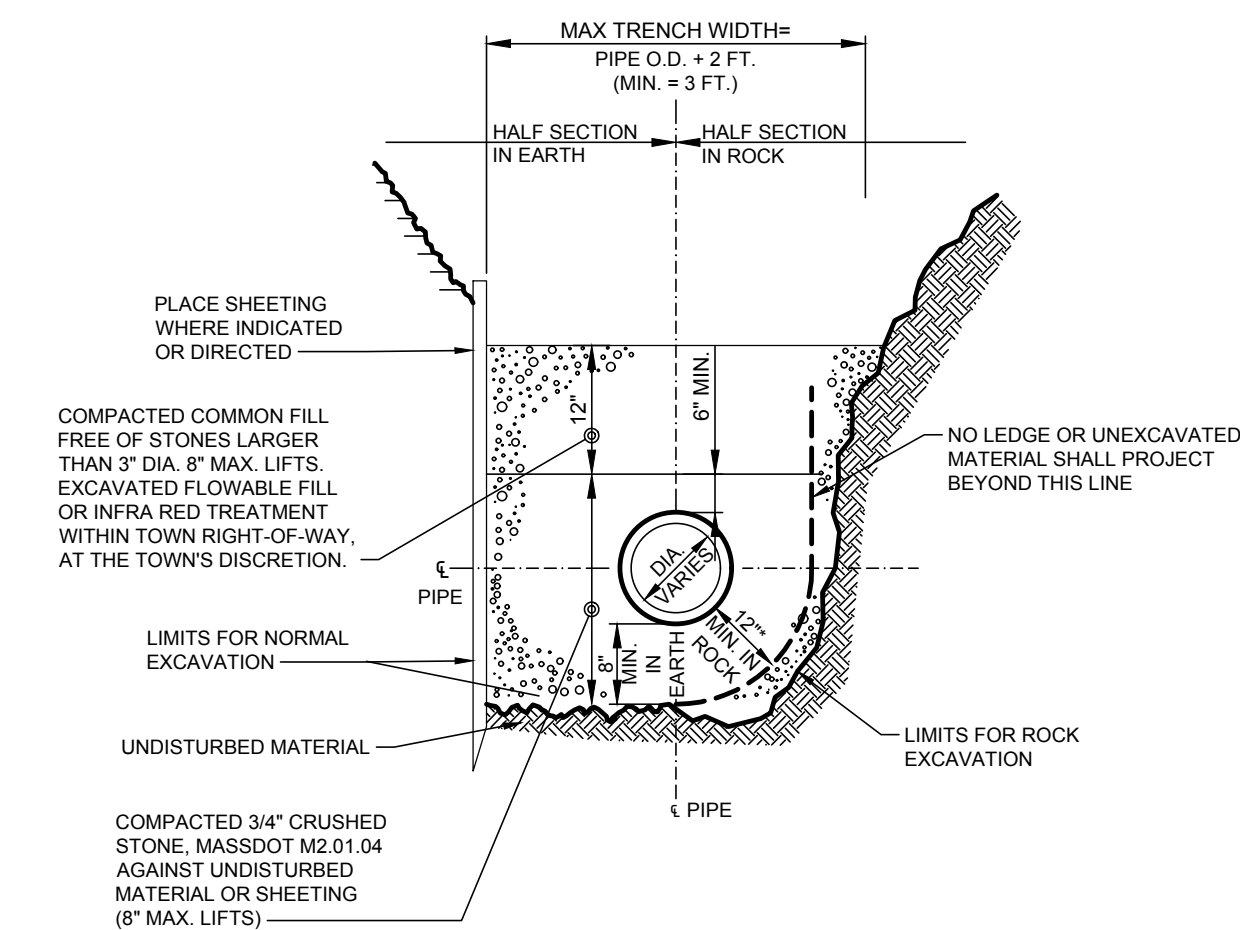
BITUMINOUS CONCRETE CURB DETAIL (CAPE COD)

SCALE: N.T.S.

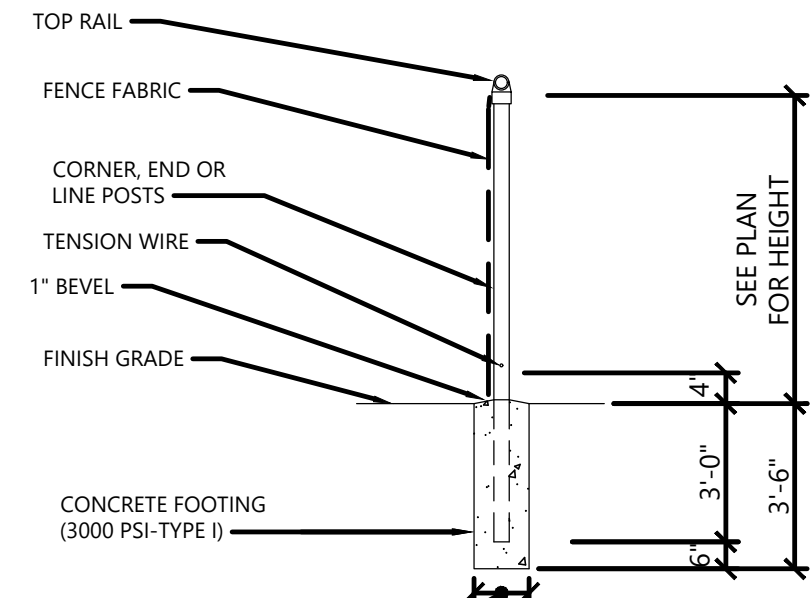
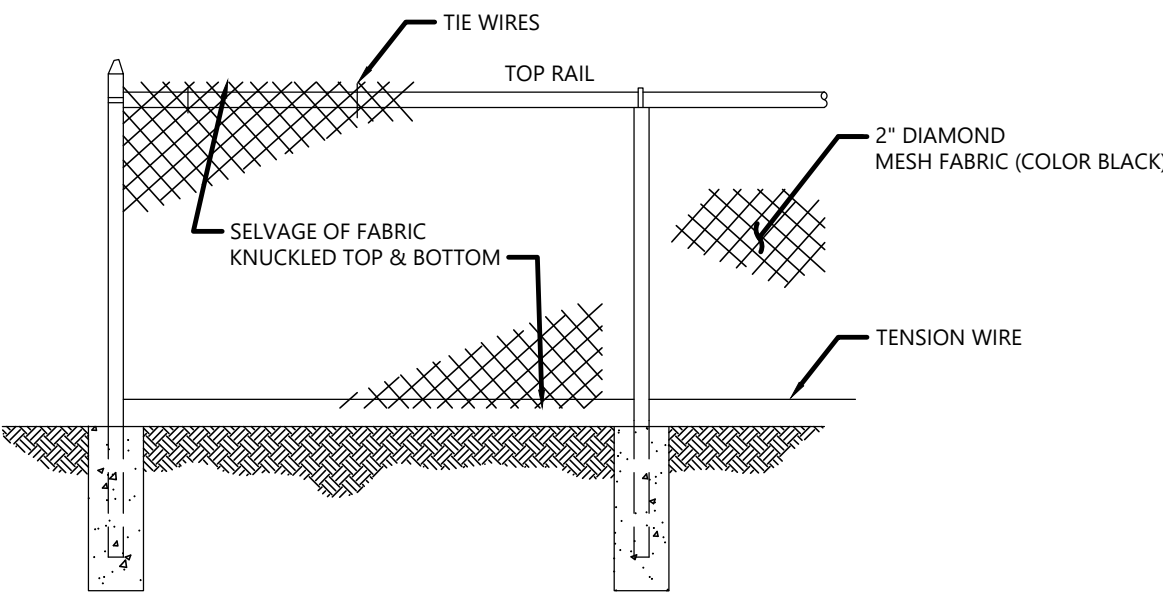
1021 & 1025 MASSACHUSETTS AVENUE ARLINGTON, MASSACHUSETTS		DATE: 09-19-2022	PROJECT No: 21-32
REVISIONS	DESCRIPTION	BY	CHECKED BY:
	PEER REVIEW COMMENTS	JB1	
	UPDATED BUILDING	JB1	
	ZBA AND CONSERVATION COMMENTS	JB1	

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SITE DETAILS I LOCATED IN ARLINGTON, MA (MIDDLESEX COUNTY) PREPARED FOR 1025 MASS AVE., LLC	SHEET 9 OF 10
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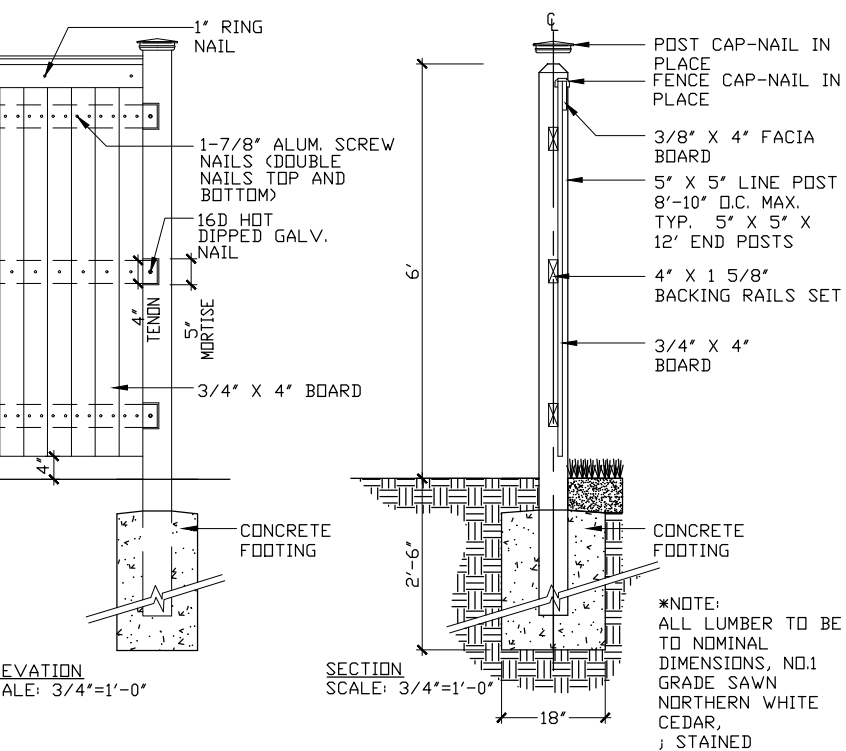


TYPICAL DRAIN TRENCH DETAIL
SCALE: N.T.S.

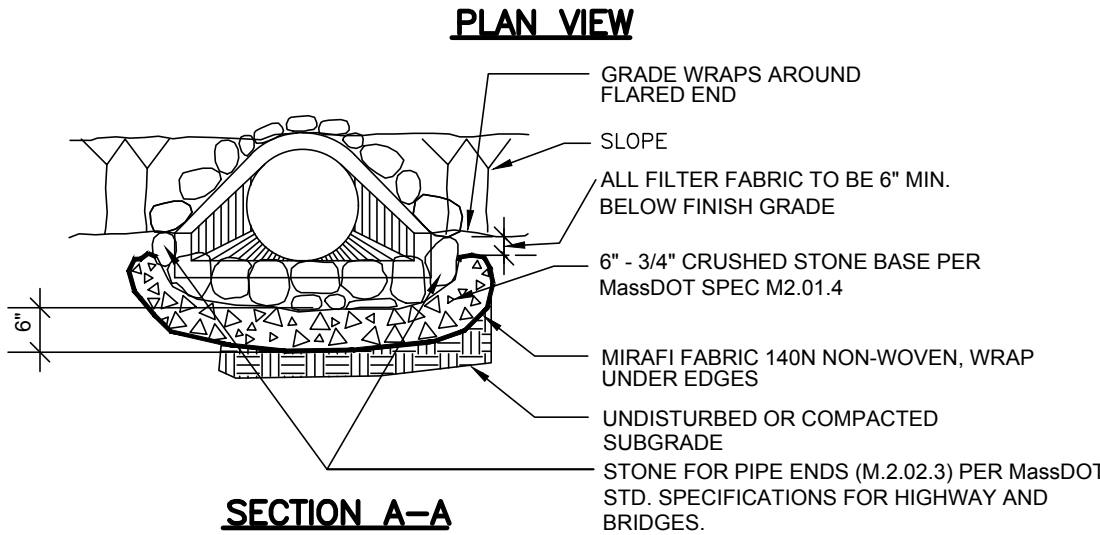
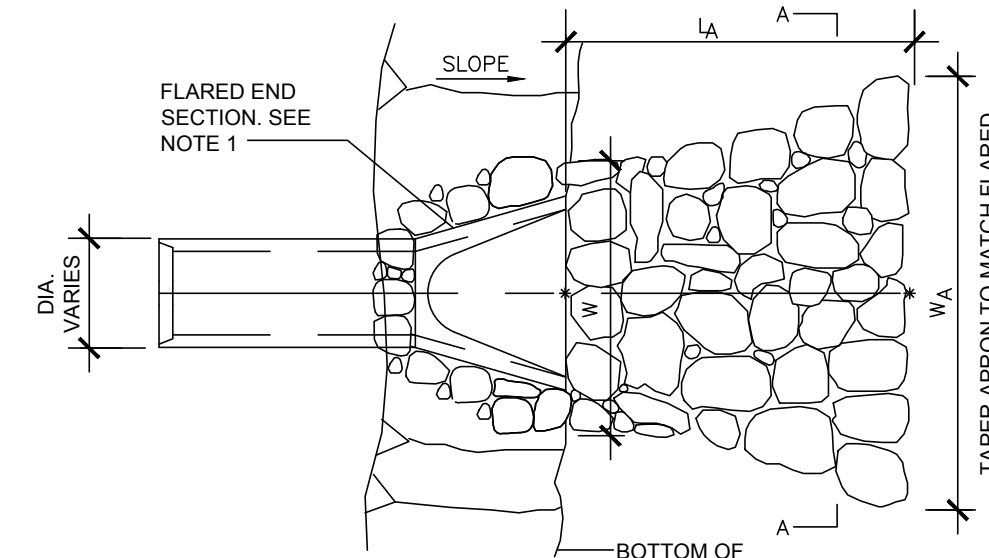


- NOTES**
1. MATERIALS TO BE SUPPLIED AND INSTALLED IN CONFORMANCE WITH "CHAIN LINK MANUFACTURER'S INSTITUTE" PRODUCT MANUAL.
 2. ALL POSTS, RAILS, FABRIC AND COMPONENTS SHALL BE BLACK VINYL COATED.

CHAINLINK FENCE
SCALE: N.T.S.



VINYL FENCE
SCALE: N.T.S.

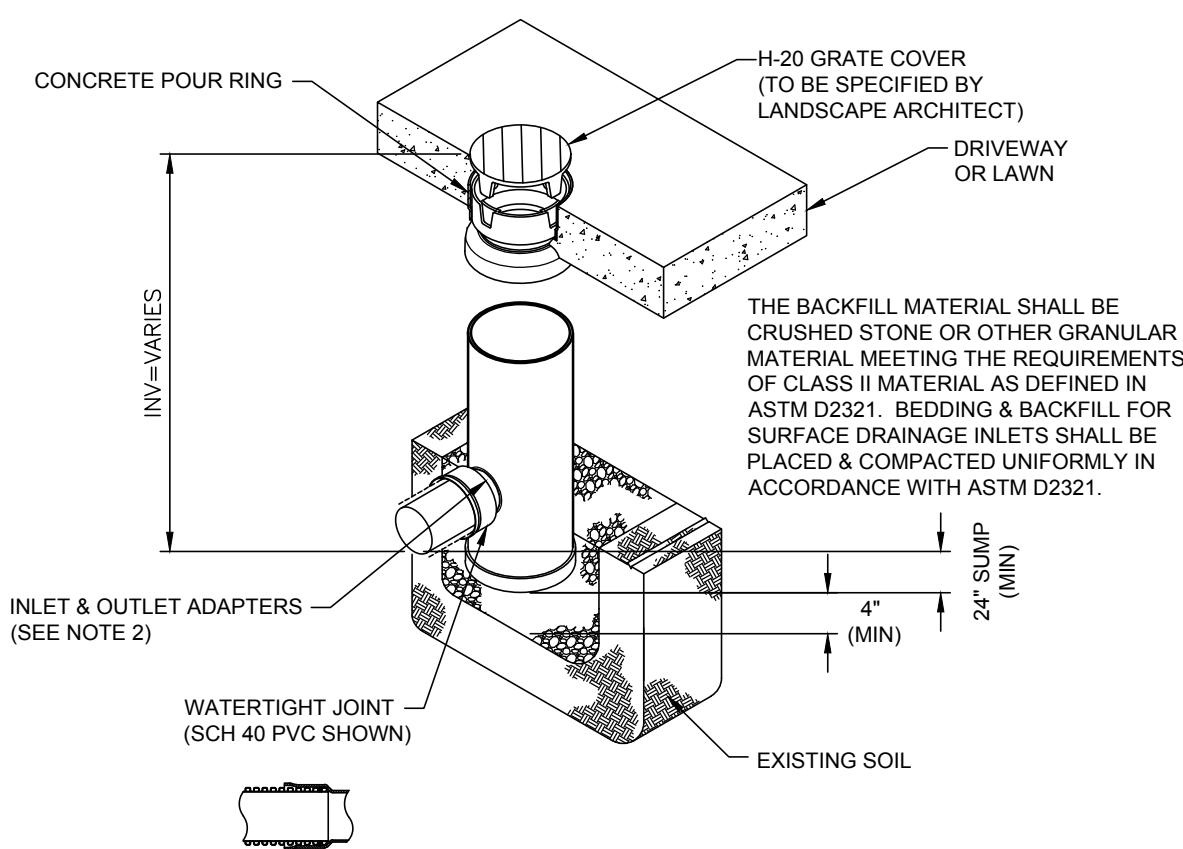


NOTES

1. THE FLARED END SECTION (FES) AND THE LAST RUN OF PIPE OUTLETTING TO THE PES SHALL BE REINFORCED CONCRETE (RCP)

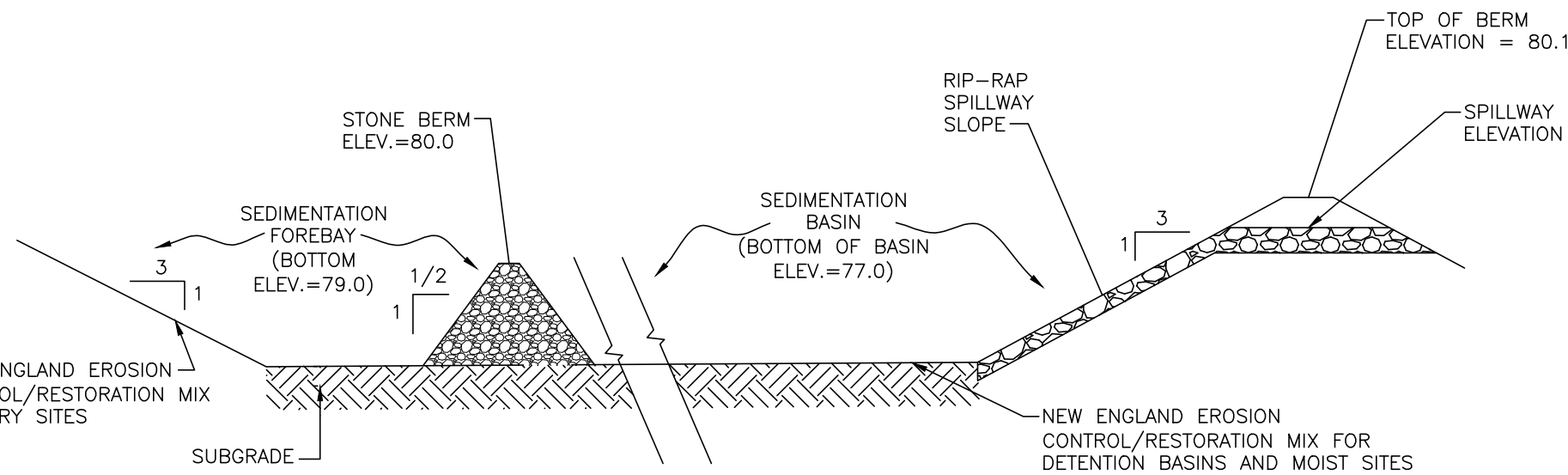
OUTLET	L ₁ (FT.)	W (FT.)	W ₂ (FT.)
FES-1	10	3	11

FLARED END SECTION WITH RIP RAP APRON
SCALE: N.T.S.



- NOTES**
1. SHALL BE 6" NYLOPLAST DRAIN BASIN OR APPROVED EQUAL.
 2. COVER SHALL COMPLY TO H-20 LOADING CAPACITY.
 3. STANDARD DRAIN BASIN HAS FIXED ADAPTER LOCATIONS OF 0° & 180°. CUSTOM DRAIN BASIN ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM SCH 40 PVC.
 4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D2212 FOR CORRUGATED HDPE (ADS N-2) HANDED DUAL WALL.
 5. USE STRUCTURE FOR OUTLET MANHOLE WITH SOLID COVER.

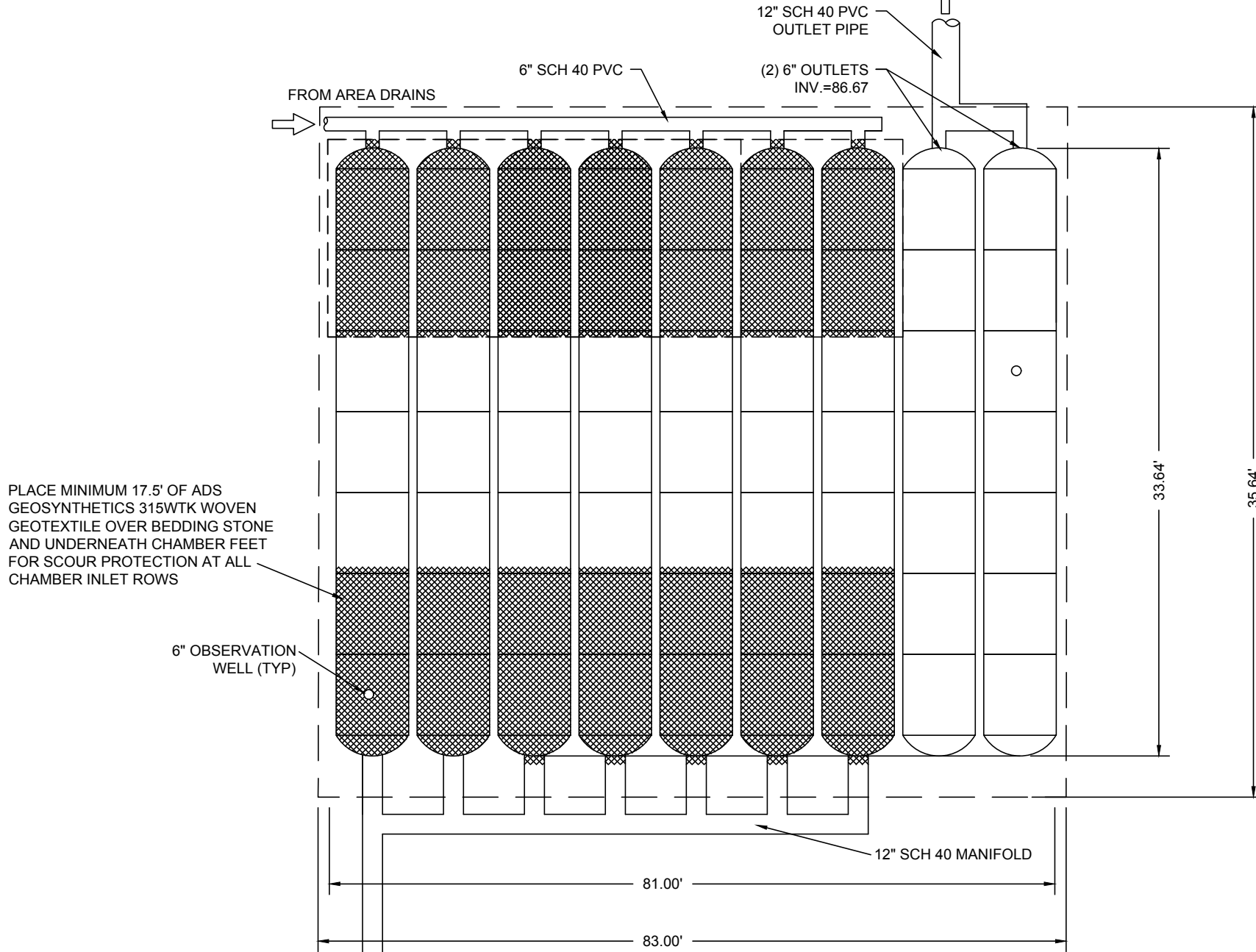
PROPOSED AREA DRAIN (WITH SUMP)
SCALE: N.T.S.



- NOTES**
1. THE CONSTRUCTION OF THE SEDIMENTATION BASIN SHALL PRECEDE ALL OTHER CONSTRUCTION.
 2. SEDIMENTATION BASIN HAS BEEN SIZED TO HOLD THE 1-INCH DESIGN STORM.

TYPICAL SEDIMENTATION BASIN SECTION
SCALE: N.T.S.

BASIN No.	MINIMUM VOLUME
1	3,800 CF



CONCEPTUAL LAYOUT - PSIS
(63) STORMTECH MC-4500 CHAMBERS

PROPOSED ELEVATIONS - PSIS

- MINIMUM FINISHED GRADE:
TOP OF STONE:
TOP OF CHAMBER:
(2) 6" OUTLET CONNECTION INVERT:
INLET CONNECTION INVERT:
BOTTOM OF CHAMBER:
BOTTOM OF STONE:
ESTIMATED SEASONAL HIGH GROUNDWATER ELEVATION (TP-01):

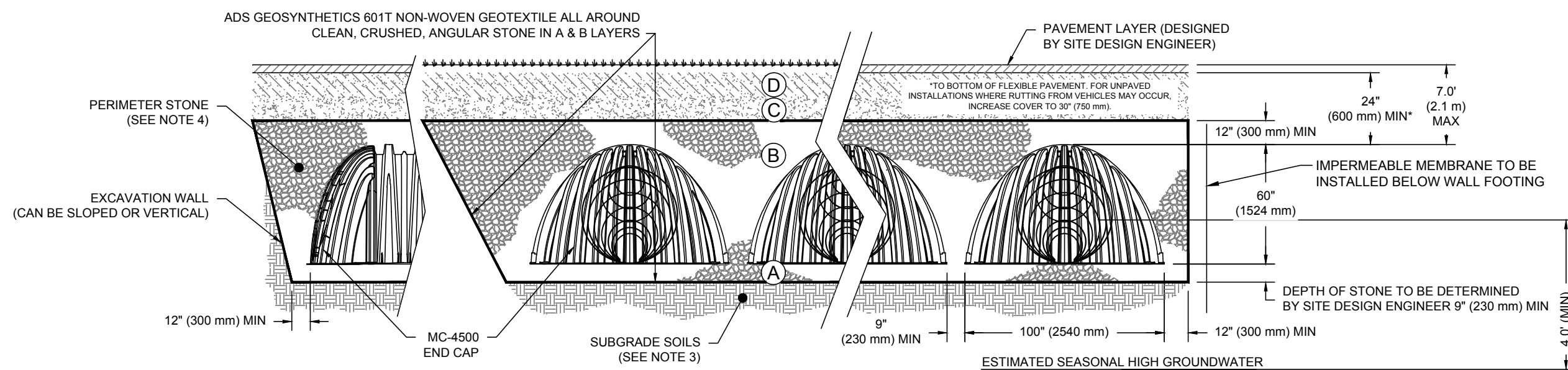
89.25
88.25
87.25
86.67
83.25
82.25
81.50
76.10

PROPOSED SUBSURFACE INFILTRATION SYSTEM (PSIS)
SCALE: N.T.S.

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 ¹ A-1, A-2.4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBODIMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

- PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
 2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
 3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
 4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

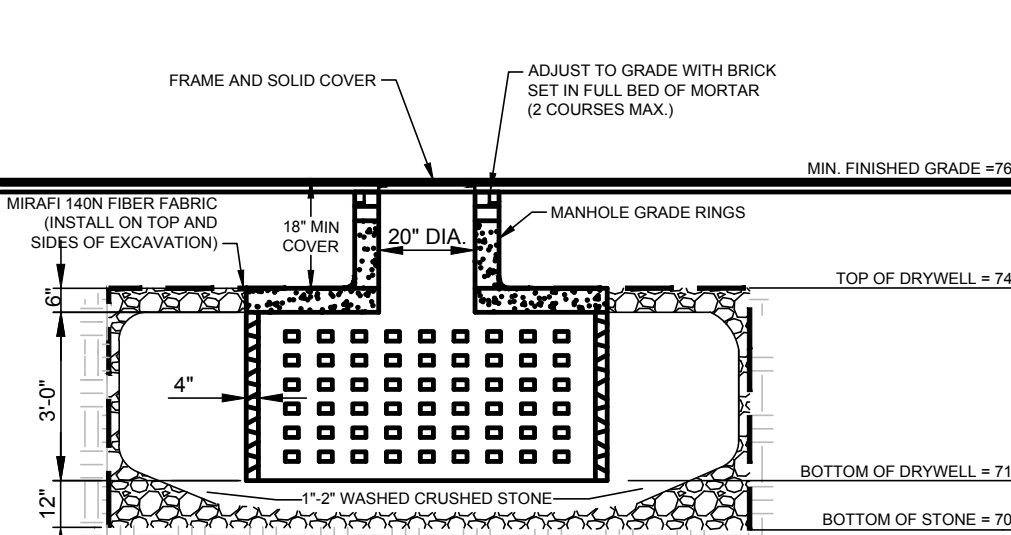
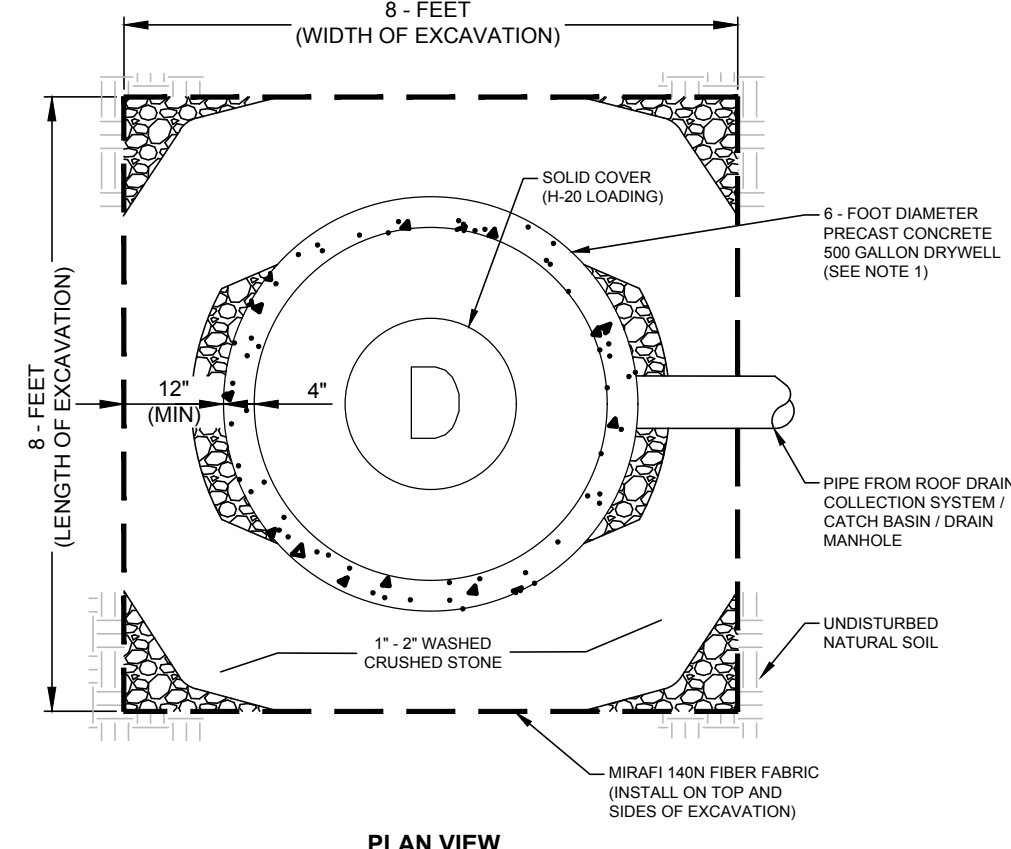


- NOTES:**
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
 2. MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
 3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
 4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
 5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION: a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/IN². AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

EXCAVATION NOTE:

1. WITHIN THE FOOTPRINT OF THE SUBSURFACE INFILTRATION SYSTEM ALL TOPSOIL, SUBSOIL AND/OR FILL SHALL BE REMOVED DOWN TO AN ELEVATION OF PARENT MATERIAL OR LEDGE AND REPLACED WITH A SAND, STONE OR CLEAN FILL MATERIAL WITH AN EQUIVALENT EXFILTRATION RATE OF 1.02 IN/HR OR GREATER. (TO BE OBSERVED AND INSPECTED BY A GEOLOGIST).

STORMTECH MC-4500 CHAMBER DETAIL (PSIS)
SCALE: N.T.S.



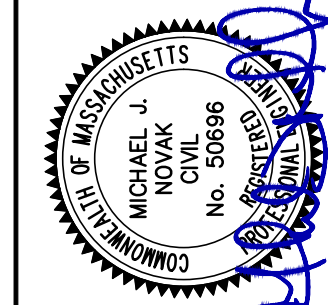
GENERAL NOTES

1. PRECAST STRUCTURE SHALL BE 500 GALLON DRYWELL (ITEM NO. 500SDWH) AS MANUFACTURED BY SHEA CONCRETE OR APPROVED EQUAL.
2. STRUCTURE AND COVER SHALL BE DESIGNED FOR H-20 LOADING.
3. CONCRETE SHALL BE 4000 PSI AFTER 28 DAYS

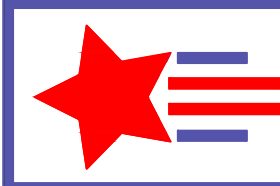
500 GALLON DRYWELL
SCALE: N.T.S.

1021 & 1025 MASSACHUSETTS AVENUE
ARLINGTON, MASSACHUSETTS
DRAWN BY: DATE: 09-19-2022
CHECKED BY: PROJECT NO: 21-32

REVISIONS	DATE	BY	DESCRIPTION
	01-23-2023	JB1	PEER REVIEW COMMENTS
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SITE DETAILS II
LOCATED IN
ARLINGTON, MA
(MIDDLESEX COUNTY)
PREPARED FOR
1025 MASS AVE., LLC

SHEET
10 OF 10

PERMITTING SET

STORMWATER ANALYSIS & CALCULATIONS

for

**1021 & 1025 MASSACHUSETTS AVENUE
ARLINGTON, MASSACHUSETTS**

Prepared for:

1025 Mass Ave., LLC
13 Wheeling Avenue
Woburn, Massachusetts 01801

Prepared by:

Patriot Engineering
35 Bedford Street, Suite 4
Lexington, Massachusetts 02420
(978) 726-2654

Date: September 9, 2022

Revised: 04/14/2023



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

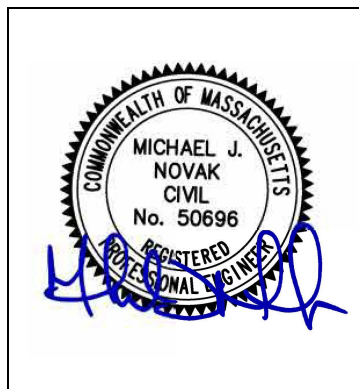
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



04-14-2023

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☒ New development
- ☐ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☒ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☒ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

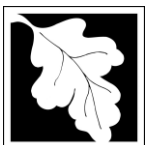
Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☐ Description and delineation of public safety features;
 - ☐ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☐ An Illicit Discharge Compliance Statement is attached;
- ☒ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

Stormwater Management Standards

Project Narrative:

The project site is comprised of two mixed-use lots located within the Neighborhood Office (B-1) District. The parcels are identified on the Town of Arlington Assessor's Map 55-2 as Lots 19 and 20. The subject properties have a total area of 47,085 s.f., and site features currently existing include two mixed-use dwellings, bituminous concrete driveways with parking lots, gravel areas, walkways, grassed/landscaped areas and wooded areas.

The applicant is proposing to construct a multi-story Chapter 40B development consisting of a multi-family dwellings (with an interior parking garage) and ground level retail space, along with a plaza, grassed and landscaped areas.

This proposal utilizes conventional stormwater management techniques including a subsurface infiltration system for the treatment and mitigation of stormwater.

The following is a summary of how the proposed project meets the DEP Stormwater Standards:

Standard 1: No new stormwater conveyances may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

There are no untreated stormwater conveyances proposed to discharge to wetlands or waters of the Commonwealth from the project.

Standard 2: Peak Rate Attenuation - Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

For the purpose of analyzing pre and post development stormwater peak rates of runoff, three (3) design points have been selected based on existing topographic conditions which were used for both the pre and the post peak rate calculations. The design points are Massachusetts Avenue to the southwest, the abutting property to the east and the abutting property to the north.

The storm event rainfall frequencies used for this analysis have been selected based upon the Extreme Precipitation Tables for the Northeast Regional Climate Center. A full detail of peak rate attenuation along with supplemental stormwater calculations utilizing HydroCAD as well as pre and post drainage site plans have been submitted with the Definitive Subdivision Application. The details of this report will show that the peak rates of runoff for the 2-year, 10-year, 50-year and 100-year events have been either maintained or reduced from pre to post conditions through the use of a subsurface infiltration system.

The hydrologic calculations from the HydroCAD® have been included in this report and are located in section tab entitled "Hydrologic Calculations".

Proposed Design Points and Subcatchment Areas

Design Point #1 (DP#1) is Massachusetts Avenue to the southwest. The contributing area to the Design Point consists of Subcatchment 1 & 101.

Design Point #1:

<u>Storm Event</u>	<u>Existing Conditions (Pre)</u> <u>Peak Flow (CFS)</u>	<u>Proposed Conditions (Post)</u> <u>Peak Flow (CFS)</u>
2-Year (4.04 in./hr.)	0.2	0.2
10-Year (6.43 in./hr.)	0.5	0.4
50-Year (9.69 in./hr.)	1.1	0.7
100-Year (11.50 in./hr.)	1.4	0.9

Design Point #2 (DP#2) is the abutting bordering property to the east. The contributing area to the Design Point consists of Subcatchment 2, 2.1 & 201, 202.

Design Point #2:

<u>Storm Event</u>	<u>Existing Conditions (Pre)</u> <u>Peak Flow (CFS)</u>	<u>Proposed Conditions (Post)</u> <u>Peak Flow (CFS)</u>
2-Year (4.04 in./hr.)	0.9	0.3
10-Year (6.43 in./hr.)	2.2	0.8
50-Year (9.69 in./hr.)	4.3	1.6
100-Year (11.50 in./hr.)	6.0	2.7

Design Point #2 (DP#2) is the abutting bordering property to the north. The contributing area to the Design Point consists of Subcatchment 3 & 301.

Design Point #3:

<u>Storm Event</u>	<u>Existing Conditions (Pre)</u> <u>Peak Flow (CFS)</u>	<u>Proposed Conditions (Post)</u> <u>Peak Flow (CFS)</u>
2-Year (4.04 in./hr.)	0.2	0.2
10-Year (6.43 in./hr.)	0.4	0.4
50-Year (9.69 in./hr.)	0.6	0.6
100-Year (11.50 in./hr.)	0.8	0.8

Standard 3: Recharge - Loss of annual recharge to groundwater shall be eliminated or minimized...at a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This standard is met when the stormwater management system is designed to infiltrate the required recharge volume in accordance with the Mass Stormwater Handbook.

Loss of annual recharge to groundwater has been minimized through the use of stormwater Best Management Practices (BMP's), one (1) subsurface infiltration system, and a proposed operation and maintenance program are proposed for this project. One (1) subsurface infiltration system has been designed for recharging groundwater.

The classification is based upon the Natural Resource Conservation Service Maps dated May 1984 (map located in the Appendix to the narrative) the site consists of a mix of unclassified and Hydrological Group D soils. Onsite soil testing was conducted by Patriot Engineering on September 22, 2021 in the areas depicted on the attached plan. This testing revealed a gravelly loamy sand parent material, which yields a Rawls Soil Group classification of A soils. Groundwater was not in either of the two test pit locations; therefore, the bottom of those test pits has been used as the estimated seasonal high groundwater elevation for design purposes.

Utilizing the current regulations, the proposed design will meet this standard as per the following calculation:

$$Rv = Fx$$

Rv = Required Recharge Volume

F = Target Depth Factor associated with hydrologic soil groups located in table 2.3.2 in Volume 3 of the Stormwater Management Handbook

x = Total impervious area proposed

Impervious area within project area (HSG A): 27,765 square feet (sf).

Required recharge volume depth factor for A type soils: 0.6 inches

Therefore Rv =

$$(27,765)(0.6\text{inches}/12\text{ inches per foot})$$

$$Rv = 1,388\text{ cubic feet (cf)}$$

The proposed subsurface infiltration system provides a total recharge storage volume of 10,498 cf below the outlet.

In accordance with the Stormwater Handbook, a capture area adjustment calculation has been provided in the appendix of this report to ensure a minimum of 65% of the site impervious areas are directed into recharge facilities. The calculation demonstrates the proposed project directs 92% of the site's proposed impervious surface areas will be directed toward the recharge facility.

Standard 4: Water Quality – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). The standard is met with pollution prevention plans, stormwater

BMP's sized to capture required water quality volume, and pretreatment measures.

The stormwater management system has been designed to remove a minimum of 80% of the average annual post-construction load of Total Suspended Solids (TSS). These percentages have been achieved by the use of a subsurface infiltration system which is collecting the runoff from the proposed roof ("clean runoff") via roof drains and downspouts and portions of proposed bituminous concrete and stone dust walkways with associated grassed/landscaped areas via area drains with sumps and underground piping.

The Stormwater Management Handbook assigns TSS removal percentages to each treatment BMP. Each treatment BMP is sized to capture the required water quality volume as calculated in accordance with the Handbook in order to achieve the assigned TSS removal rates.

General Equation from Stormwater Management Handbook

$$V_{wq} = (D_{wq})(A)$$

V_{wq} = required water quality volume

D_{wq} = water quality depth (1" for critical areas, 0.5" for non-critical areas)

A = impervious area

The following are treatment sizing calculations for portions of the treatment trains based on the 0.5" for non-critical areas:

Train 1 (Roof area/bit. conc. walk drains to PSIS)

$$V_{wq} = (25,522)(0.5"/12) = 1,063 \text{ cf}$$

The proposed subsurface infiltration system provides a total recharge storage volume of 10,498 cf below the outlet.

A separate document entitled "Operation and Maintenance & Erosion and Sedimentation Control Program for a Proposed Stormwater Management System" is included as part of this report. Suitable practices for source control and long-term pollution prevention have been identified and shall be implemented as discussed.

The utilization of pretreatment and treatment BMP's combined with the operation and maintenance plan provides compliance with this standard.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs) – Source control and pollution prevention shall be implemented in accordance with the Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.

Stormwater Standard 5 is not applicable to this project. The proposed development will not subject the site to higher potential pollutant loads as defined in the Massachusetts Department of Environmental protection Wetlands and Water Quality Regulations.

LUHPPLs are identified in 310 CMR 22.20B(2) and C(2)(a)-(k) and (m) and CMR 22.21(2)(a)(1)-(8) and (b)(1)-(6), areas within a site that are the location of activities that are subject to an individual National Pollutant Discharge Elimination System (NPDES) permit or the NPDES Multi-sector General Permit; auto fueling facilities, exterior fleet storage areas, exterior vehicle service and equipment cleaning areas; marinas and boatyards; parking lots with high-intensity-use; confined disposal facilities and disposal sites.

Standard 6: Critical Areas – Stormwater discharges to critical areas require the use of specific source control and pollution prevention measures and specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas.

Stormwater Standard 6 is not applicable to this project given that proposed stormwater does not discharge near a critical area. Critical areas being Outstanding Resource Waters and Special Resource Waters as designated in 314 CMR 4.0, recharge areas for public water supplies as defined in 310 CMR 22.02, bathing beaches as defined in 105 CMR 445.000, cold-water fisheries and shellfish growing areas as defined in 314 CMR 9.02 and 310 CMR 10.04. The design points are not considered a critical area therefore Standard #6 does not apply to this project.

Standard 7: Redevelopments – A redevelopment project is required to meet Standards 1-6 only to the maximum extent practicable. Remaining standards shall be met as well as the project shall improve the existing conditions.

Stormwater Standard 7 is not applicable to this project. Within the Stormwater Management Handbook (volume 1 chapter 1 page 20), the definition of a redevelopment project includes, “development, rehabilitation, expansion and phased projects on previously developed sites, provided the redevelopment results in no net increase in impervious area”.

This project will not result in a reduction of impervious area in the proposed conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan shall be implemented.

An Operation and Maintenance & Erosion and Sediment Control Program for a Proposed Stormwater Management System is included with this report. The program details the construction period operation and maintenance plan and sequencing for pollution prevention measures and erosion and sedimentation controls. Locations of erosion control measures for the project are depicted on the site plan set accompanying this report.

Standard 9: A long term Operation and Maintenance Plan shall be implemented.

An Operation and Maintenance & Erosion and Sediment Control Program for a Proposed Stormwater Management System is included with this report. The long term operation and maintenance section of the program provides details and the schedule for routine and non-routine maintenance tasks to be implemented at the completion of the project.

Standard 10: Prohibition of Illicit Discharges – Illicit discharges to the stormwater management system are prohibited.

Illicit discharges to the stormwater management system are discharges that are not entirely comprised of stormwater. Discharges to the stormwater management system from the following activities or facilities are permissible: Firefighting, water line flushing, landscape irrigation, uncontaminated groundwater, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated water from swimming pools, water used for street washing and water used to clean residential buildings without detergents. All other illicit discharges are prohibited.

There are no known illicit discharges anticipated through the completion of this project. During construction and post construction procedures are provided to dissipate the potential for illicit discharges to the drainage system. Post construction preventions of illicit discharges are described in the Operation and Maintenance Program under the Good Housekeeping Practices section of the report.

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 - 2-Year 24 Hour Storm Event Analysis
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 - 100-Year 24 Hour Storm Event Analysis
- * Proposed Conditions
 - Watershed Routing Diagram
 - 2-Year 24 Hour Storm Event Analysis
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Appendix:

- * Pre-Development Drainage Plan
- * Post-Development Drainage Plan
- * NRCS – Soils Map
- * TSS Calculation
- * Capture Area Adjustment
- * 72-Hour Draw Down Calculations
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CALCULATION METHODS

- TR 20 SCS Unit Hydrograph Procedure
- Runoff Curve Numbers
- Time of Concentration by TR55 Methodology
- Reach and Pond Rating by the Storage-Indication Method
- Manning Equation

SOURCE OF DATA

- Technical Report No. 20
- Technical Report No. 55
- Extreme Precipitation Tables for the NOAA Atlas-14
- Field Survey and Soil Testing by RJ O'Connell and Associates.
- Massachusetts Stormwater Handbook February 2008

Calculation Objective

The purpose of this drainage analysis is to design a stormwater management system that maintains and/or reduces the peak rates and volumes of stormwater runoff from pre-development conditions in the post development conditions for the 2, 10, 50 and 100-year design storm events

The proposed stormwater management system designed for this project will consist of the installation of one (1) subsurface infiltration system to allow for the mitigation of the runoff from the proposed impervious areas within the site.

There is one (1) proposed subsurface infiltration system to capture and mitigate stormwater runoff from the entire proposed roof and portions of the proposed walkways and grassed/landscaped areas. The installation of the subsurface infiltration system will allow the development to not have an increase in stormwater runoff (rate or volume) from the site during the 2, 10, 50 and 100-year design storms.

Classification of Soils

Existing soil conditions within the limits of the watershed analyzed for this study have been categorized as:

- Urban Land: Unclassified Hydrologic Group
- Udorthents, wet substratum: Hydrologic Group D

The classification is based upon the Natural Resource Conservation Service Maps dated May 1984 (map located in the Appendix to the narrative) the site consists of a mix of Urban Land (unclassified) and Hydrological Group D soils. Onsite soil testing was conducted by RJ O'Connell & Associates on September 22, 2021 in the areas depicted on the attached plan. This testing revealed a gravelly loamy sand parent material, which yields a Rawls Soil Group classification of A soils. Groundwater was not in either of the two test pit locations; therefore, the bottom of those test pits has been used as the estimated seasonal high groundwater elevation for design purposes.

Selection of Storm Events

The storm event rainfall frequencies used for this analysis have been selected based upon the Extreme Precipitation Tables for the NOAA Atlas 14. Rainfall frequency data has been provided as follows:

<u>Frequency</u>	<u>Rainfall [24 hour event (inch)]</u>
2 year	4.04
10 year	6.43
50 Year	9.69
100 year	11.50

Existing Site Overview

The project site is comprised of two mixed-use lots located within the Neighborhood Office (B-1) District. The parcels are identified on the Town of Arlington Assessor's Map 55-2 as Lots 19 and 20. The subject properties have a total area of 47,085 s.f., and site features currently existing include two mixed-use dwellings, bituminous concrete driveways with parking lots, gravel areas, walkways, grassed/landscaped areas and wooded areas.

The slope of the existing site promotes overland runoff in three (3) main directions: southwesterly toward Massachusetts Avenue, easterly and northerly toward an existing parking lot on the abutting property. This results in four (4) subcatchments (SC) and three (3) design points (DP):

- **Subcatchment SC-1** – This subcatchment area consists of portions of existing mixed-use buildings, driveway/walkways and grassed areas. Stormwater runoff generated in this subcatchment flows southwest to Massachusetts Avenue to design point 1 (**DP1**).
- **Subcatchment SC-2** – This subcatchment area consists of portions of existing mixed-use buildings, driveway/walkways, gravel areas, shed remnants and grassed/wooded areas. Stormwater runoff generated in this subcatchment flows east to an existing depression that overflows towards the existing parking lot on the abutting property to design point 2 (**DP2**).
- **Subcatchment SC-2.1** – This subcatchment area consists of portions of existing mixed-use buildings, driveway/walkways, gravel areas and grassed/wooded areas. Stormwater runoff generated in this subcatchment flows east to an existing depression that overflows towards the existing parking lot on the abutting property to design point 2 (**DP2**).
- **Subcatchment SC-3** – This subcatchment area consists of portions of existing mixed-use buildings, driveway/walkways, gravel areas, shed remnants and grassed/wooded areas. Stormwater runoff generated in this subcatchment flows north to the existing parking lot on the abutting property to design point 3 (**DP3**).

Proposed Site Overview

The proposed project is comprised of the development of the existing properties into a 40B mixed-use development. The applicant is proposing a multi-story mixed-used building with residential and ground level commercial components. The building will be constructed with an interior parking garage, driveway, walkways, a stormwater management system, new utilities and associated grassed/landscaped areas.

A comprehensive stormwater management system that meets the Town of Arlington and MassDEP standards. The project proponent proposes to install a single subsurface infiltration system to collect and infiltrate stormwater run-off from the proposed structure as depicted on the Site Plans. The accompanying Stormwater Report contains supporting calculations, and an Operation and Maintenance Plan, and demonstrates that

peak rates and volumes of stormwater run-off will be maintained or reduced for the 2, 10, 50, and 100-year statistical storm events. The proposed project has been developed with the intent of maintaining the existing drainage patterns of the site to the maximum extent practicable.

The four (4) subcatchments in the post construction scenario are as follows:

- **Subcatchment SC101** – This subcatchment area consists of portions of the proposed driveway/walkway, portions of the abutting building roof area and grassed areas. Stormwater runoff generated in this subcatchment flows southwest to Massachusetts Avenue to design point 1 (**DP1**).
- **Subcatchment SC201** – This subcatchment area consists of a portion of the proposed walkway, portions of the abutting lot roofs and grassed areas. Stormwater runoff generated in this subcatchment flows east to the existing parking lot on the abutting property to design point 2 (**DP2**).
- **Subcatchment SC202** – This subcatchment area consists of proposed roof area, portions of the proposed bituminous concrete and stone dust walkways, and grassed/landscaped areas. Stormwater runoff generated in this subcatchment will be directed to proposed subsurface infiltration system (**PSIS-1**), via gutters and downspouts or area drains and pip. PSIS-1 has been designed with an overflow system that allows a portion of the stormwater runoff directed to the system to overflow east to the existing parking lot on the abutting property to design point 2 (**DP2**).
- **Subcatchment SC301** – This subcatchment area consists of proposed grass area with a mulched walkway for emergency fire access. Stormwater runoff generated in this subcatchment flows north to the existing parking lot on the abutting property to design point 3 (**DP3**).

Summary of Flows at the Design Point

Design Point 1 (DP1):

Peak Rates (CFS)

DP1	2-Year Storm	10-Year Storm	50-Year Storm	100-Year Storm
Existing	0.2	0.5	1.1	1.4
Proposed	0.2	0.4	0.7	0.9

Peak Volumes (AF)

DP1	2-Year Storm	10-Year Storm	50-Year Storm	100-Year Storm
Existing	0.02	0.04	0.08	0.10
Proposed	0.01	0.03	0.05	0.06

Design Point 2 (DP2):**Peak Rates (CFS)**

DP2	2-Year Storm	10-Year Storm	50-Year Storm	100-Year Storm
Existing	0.9	2.2	4.3	6.2
Proposed	0.3	0.8	1.6	2.7

Peak Volumes (AF)

DP2	2-Year Storm*	10-Year Storm*	50-Year Storm	100-Year Storm
Existing	0.03	0.11	0.28	0.38
Proposed	0.03	0.07	0.20	0.32

*NO FLOW FROM INFILTRATION SYSTEM

Design Point 3 (DP3):**Peak Rates (CFS)**

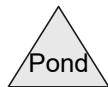
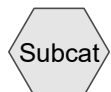
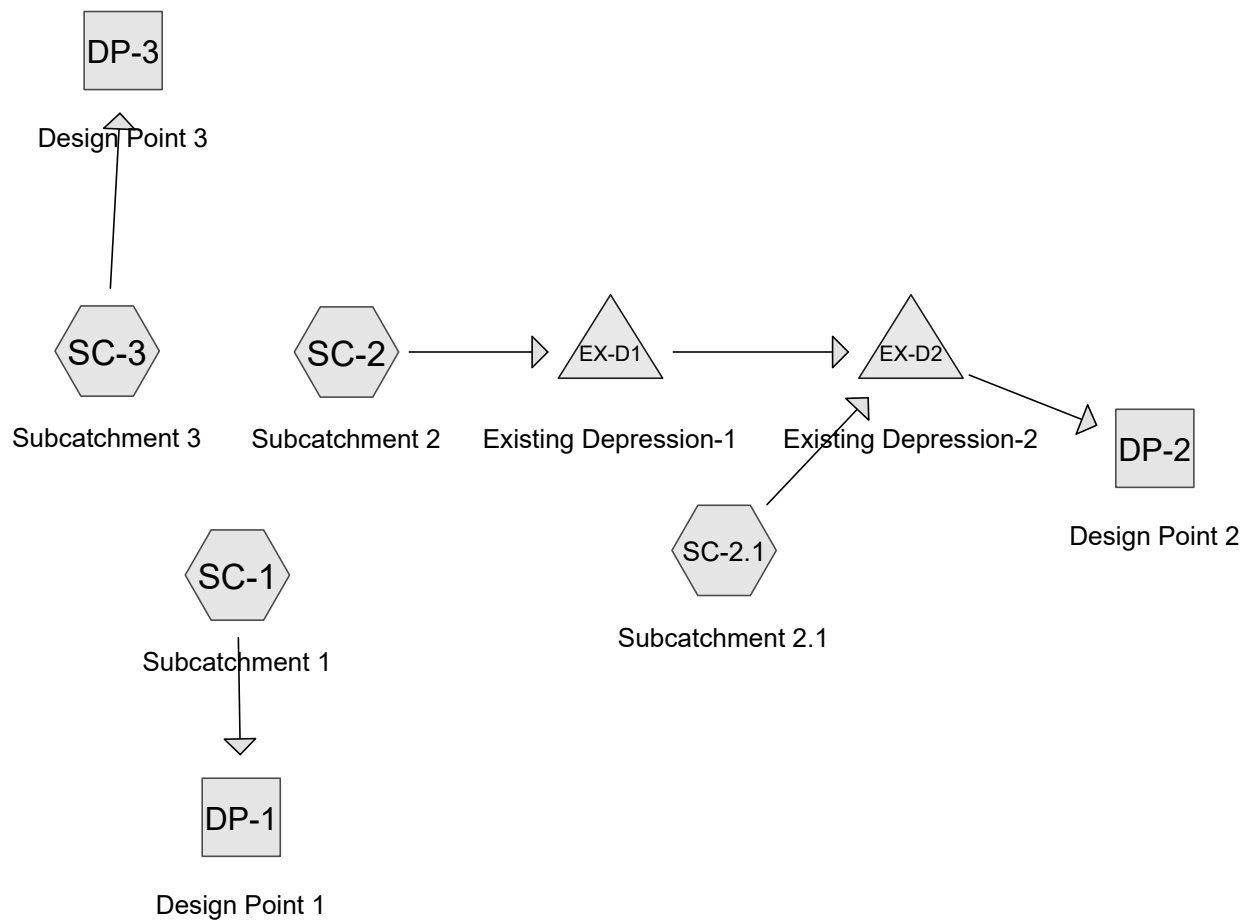
DP3	2-Year Storm	10-Year Storm	50-Year Storm	100-Year Storm
Existing	0.2	0.4	0.6	0.8
Proposed	0.2	0.4	0.6	0.8

Peak Volumes (AF)

DP3	2-Year Storm	10-Year Storm	50-Year Storm	100-Year Storm
Existing	0.01	0.03	0.05	0.06
Proposed	0.01	0.03	0.05	0.06

Conclusion

The calculations for each of the selected Design Points demonstrate that proposed site improvements will not result in an increase in the peak rate or volume of stormwater runoff for the 2-year, 10-year, 50-year or 100-year 24-hour storm events at the design points with the proposed stormwater mitigation system improvements.



Routing Diagram for 21583-PRE_rev1
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Prepared by {enter your company name here}

Printed 1/19/2023

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Yr 24 Hr	Type III 24-hr		Default	24.00	1	4.04	2
2	10-Yr 24 Hr	Type III 24-hr		Default	24.00	1	6.43	2
3	50-Yr 24 Hr	Type III 24-hr		Default	24.00	1	9.69	2
4	100-Yr 24 Hr	Type III 24-hr		Default	24.00	1	11.50	2

21583-PRE_rev1

Prepared by {enter your company name here}

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.373	39	>75% Grass cover, Good, HSG A (SC-1, SC-2, SC-2.1)
0.002	80	>75% Grass cover, Good, HSG D (SC-2.1)
0.001	98	Bulkheads (SC-2, SC-2.1)
0.039	98	Driveway/Walkways (SC-1)
0.232	98	Driveway/Walkways/Patios (SC-2, SC-2.1)
0.015	96	Gravel surface, HSG A (SC-2, SC-2.1)
0.118	98	Roof (SC-1, SC-2, SC-2.1)
0.004	98	Shed (SC-2)
0.180	30	Woods, Good, HSG A (SC-2, SC-2.1)
0.205	77	Woods, Good, HSG D (SC-2, SC-2.1, SC-3)
1.169	65	TOTAL AREA

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentSC-1: Subcatchment1 Runoff Area=7,364 sf 45.00% Impervious Runoff Depth>1.11"
 Flow Length=52' Slope=0.0200 ' ' Tc=6.0 min CN=66 Runoff=0.2 cfs 0.02 af

SubcatchmentSC-2: Subcatchment2 Runoff Area=11,386 sf 15.47% Impervious Runoff Depth>0.21"
 Flow Length=212' Tc=11.4 min CN=46 Runoff=0.0 cfs 0.00 af

SubcatchmentSC-2.1: Subcatchment2.1 Runoff Area=28,605 sf 42.28% Impervious Runoff Depth>1.42"
 Flow Length=225' Tc=8.2 min CN=71 Runoff=0.9 cfs 0.08 af

SubcatchmentSC-3: Subcatchment3 Runoff Area=3,546 sf 0.00% Impervious Runoff Depth>1.84"
 Flow Length=57' Tc=6.0 min CN=77 Runoff=0.2 cfs 0.01 af

Reach DP-1: Design Point 1 Inflow=0.2 cfs 0.02 af
 Outflow=0.2 cfs 0.02 af

Reach DP-2: Design Point 2 Inflow=0.9 cfs 0.03 af
 Outflow=0.9 cfs 0.03 af

Reach DP-3: Design Point 3 Inflow=0.2 cfs 0.01 af
 Outflow=0.2 cfs 0.01 af

Pond EX-D1: Existing Depression-1 Peak Elev=79.19' Storage=27 cf Inflow=0.0 cfs 0.00 af
 Discarded=0.0 cfs 0.00 af Primary=0.0 cfs 0.00 af Outflow=0.0 cfs 0.00 af

Pond EX-D2: Existing Depression-2 Peak Elev=76.59' Storage=507 cf Inflow=0.9 cfs 0.08 af
 Discarded=0.1 cfs 0.04 af Primary=0.9 cfs 0.03 af Outflow=1.0 cfs 0.08 af

Total Runoff Area = 1.169 ac Runoff Volume = 0.11 af Average Runoff Depth = 1.13"
66.27% Pervious = 0.774 ac 33.73% Impervious = 0.394 ac

Summary for Subcatchment SC-1: Subcatchment 1

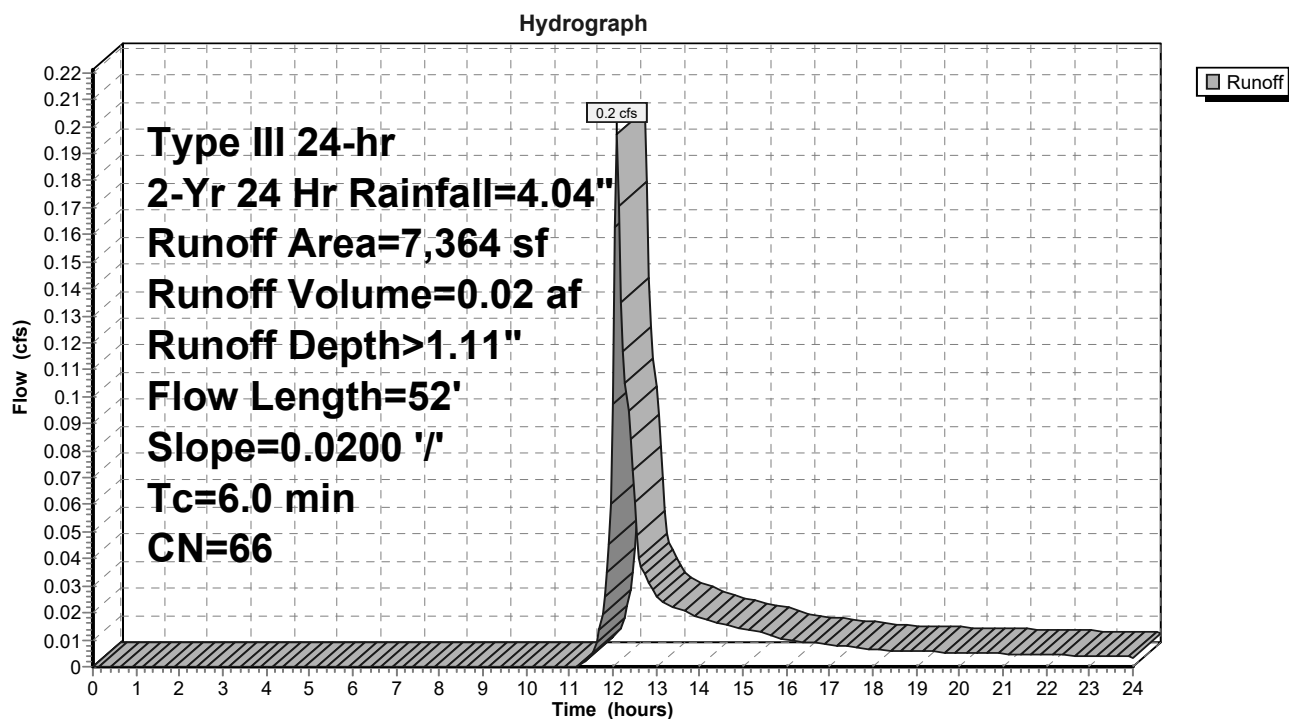
Runoff = 0.2 cfs @ 12.10 hrs, Volume= 0.02 af, Depth> 1.11"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

Area (sf)	CN	Description
3,644	39	>75% Grass cover, Good, HSG A
* 1,684	98	Driveway/Walkways
* 1,412	98	Roof
* 218	98	Roof
406	39	>75% Grass cover, Good, HSG A
7,364	66	Weighted Average
4,050		55.00% Pervious Area
3,314		45.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	24	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
0.4	26	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.04"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8					Direct Entry, Min. Engineering Practice
6.0	52	Total			

Subcatchment SC-1: Subcatchment 1



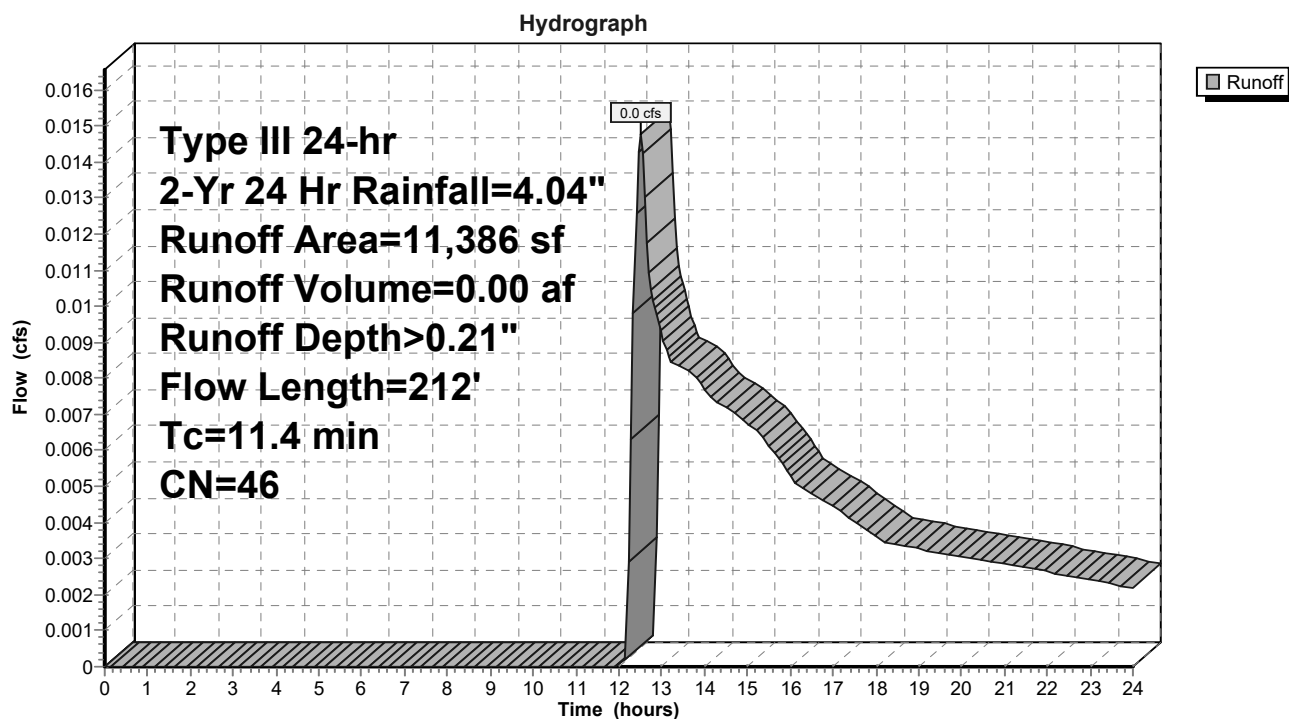
Summary for Subcatchment SC-2: Subcatchment 2

Runoff = 0.0 cfs @ 12.50 hrs, Volume= 0.00 af, Depth> 0.21"
 Routed to Pond EX-D1 : Existing Depression-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

Area (sf)	CN	Description
3,752	39	>75% Grass cover, Good, HSG A
23	77	Woods, Good, HSG D
* 811	98	Driveway/Walkways/Patios
* 735	98	Roof
3,208	30	Woods, Good, HSG A
* 23	98	Bulkheads
* 192	98	Shed
46	96	Gravel surface, HSG A
2,596	39	>75% Grass cover, Good, HSG A
11,386	46	Weighted Average
9,625		84.53% Pervious Area
1,761		15.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
7.1	29	0.0200	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.7	50	0.0600	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	76	0.1050	1.6		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	36	0.2000	2.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	212	Total			

Subcatchment SC-2: Subcatchment 2

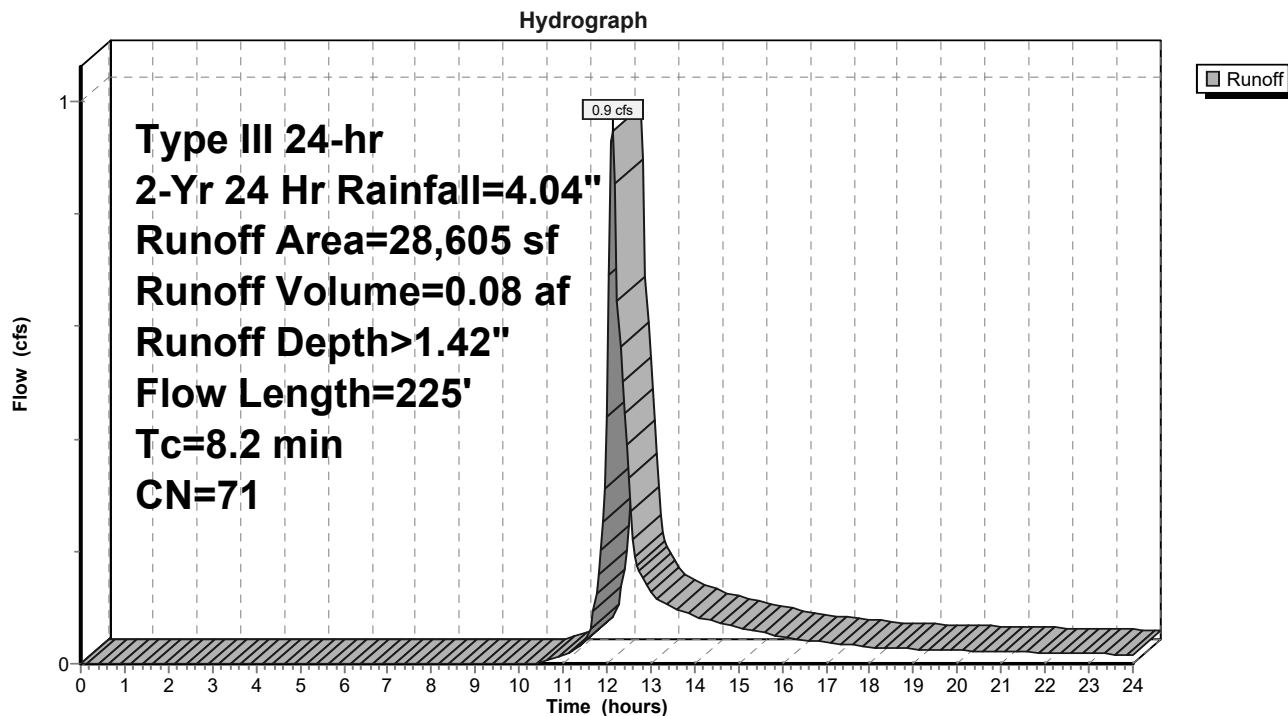
Summary for Subcatchment SC-2.1: Subcatchment 2.1

Runoff = 0.9 cfs @ 12.13 hrs, Volume= 0.08 af, Depth> 1.42"
 Routed to Pond EX-D2 : Existing Depression-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

Area (sf)	CN	Description
0	39	>75% Grass cover, Good, HSG A
76	80	>75% Grass cover, Good, HSG D
5,371	77	Woods, Good, HSG D
* 9,310	98	Driveway/Walkways/Patios
* 2,765	98	Roof
4,626	30	Woods, Good, HSG A
* 20	98	Bulkheads
597	96	Gravel surface, HSG A
5,840	39	>75% Grass cover, Good, HSG A
28,605	71	Weighted Average
16,510		57.72% Pervious Area
12,095		42.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	41	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
1.8	9	0.0560	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
1.7	119	0.0560	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	56	0.2210	2.4		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	225	Total			

Subcatchment SC-2.1: Subcatchment 2.1

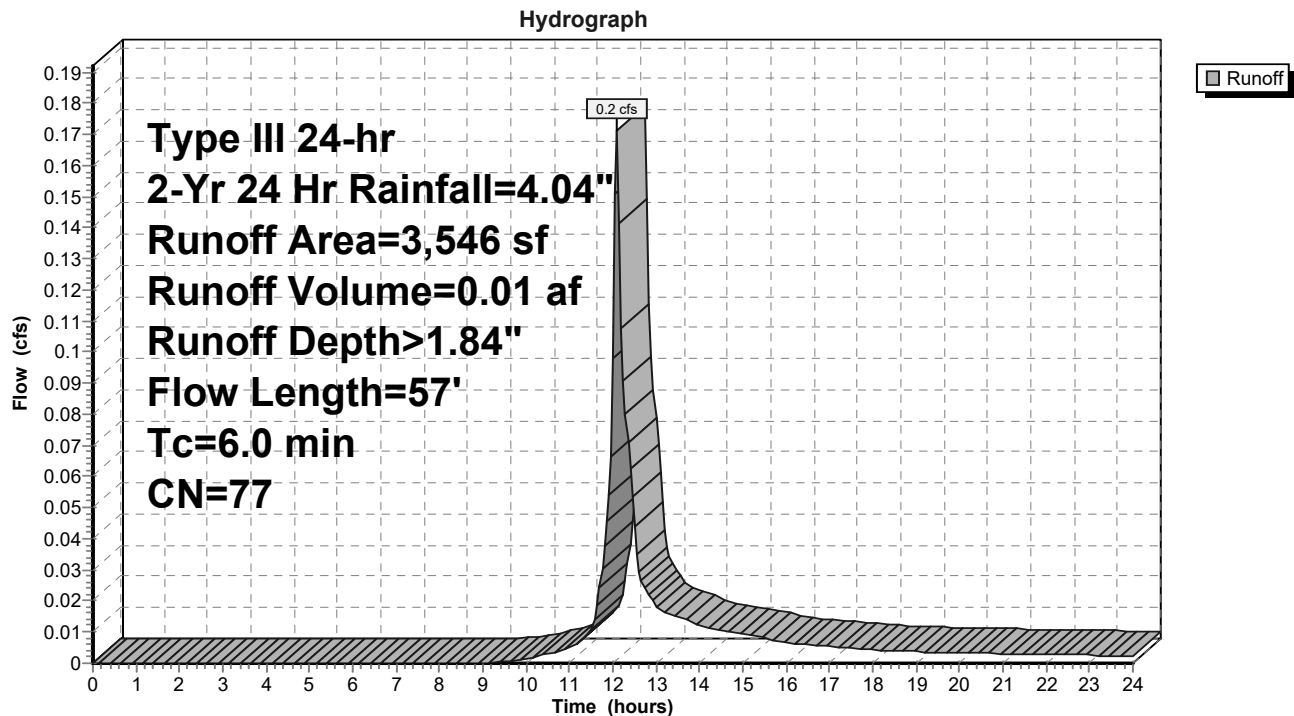
Summary for Subcatchment SC-3: Subcatchment 3

Runoff = 0.2 cfs @ 12.10 hrs, Volume= 0.01 af, Depth> 1.84"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

Area (sf)	CN	Description
3,546	77	Woods, Good, HSG D
3,546		100.00% Pervious Area

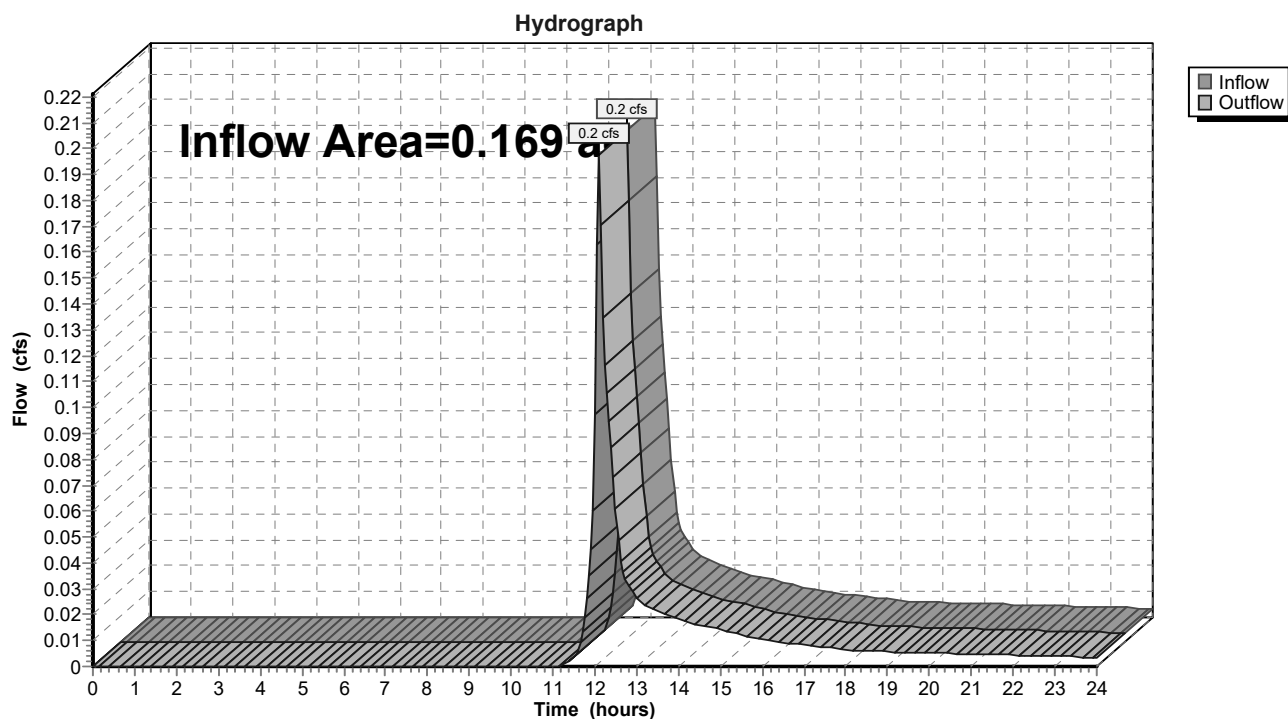
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.1170	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.2	7	0.0200	0.7		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.6	57	Total, Increased to minimum Tc = 6.0 min			

Subcatchment SC-3: Subcatchment 3

Summary for Reach DP-1: Design Point 1

Inflow Area = 0.169 ac, 45.00% Impervious, Inflow Depth > 1.11" for 2-Yr 24 Hr event
Inflow = 0.2 cfs @ 12.10 hrs, Volume= 0.02 af
Outflow = 0.2 cfs @ 12.10 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

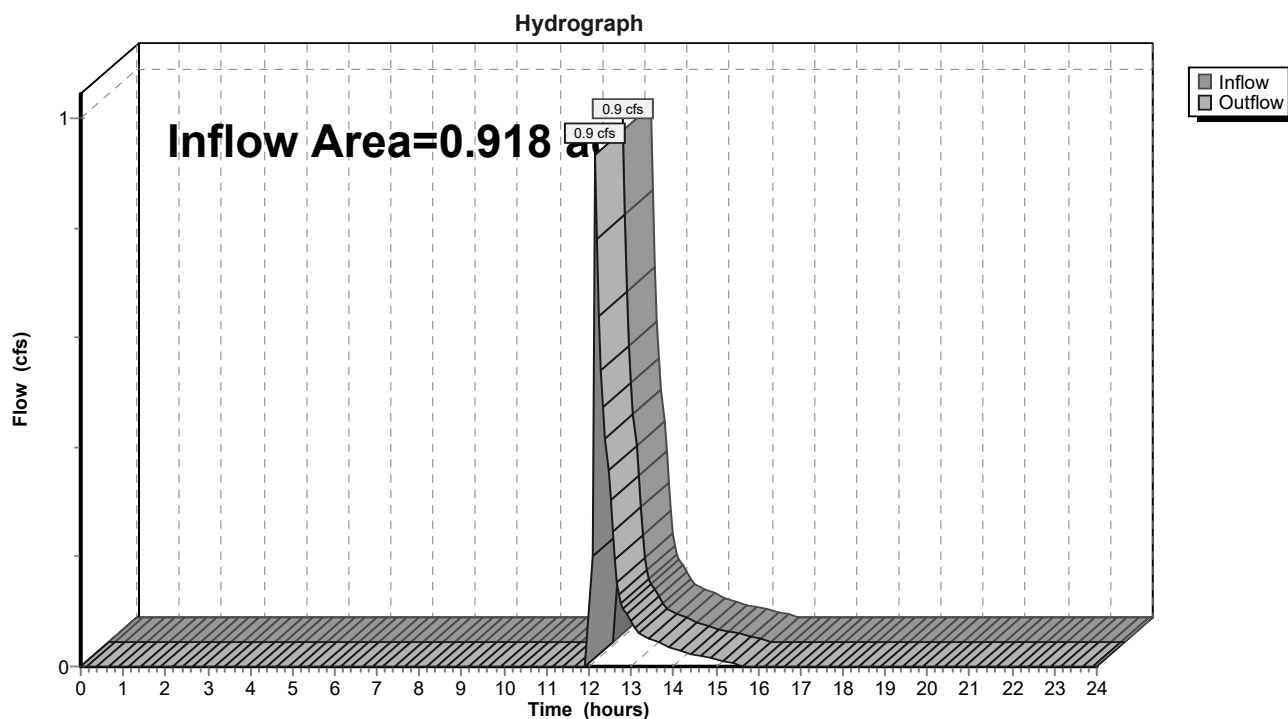
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1

Summary for Reach DP-2: Design Point 2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth = 0.41" for 2-Yr 24 Hr event
Inflow = 0.9 cfs @ 12.17 hrs, Volume= 0.03 af
Outflow = 0.9 cfs @ 12.17 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

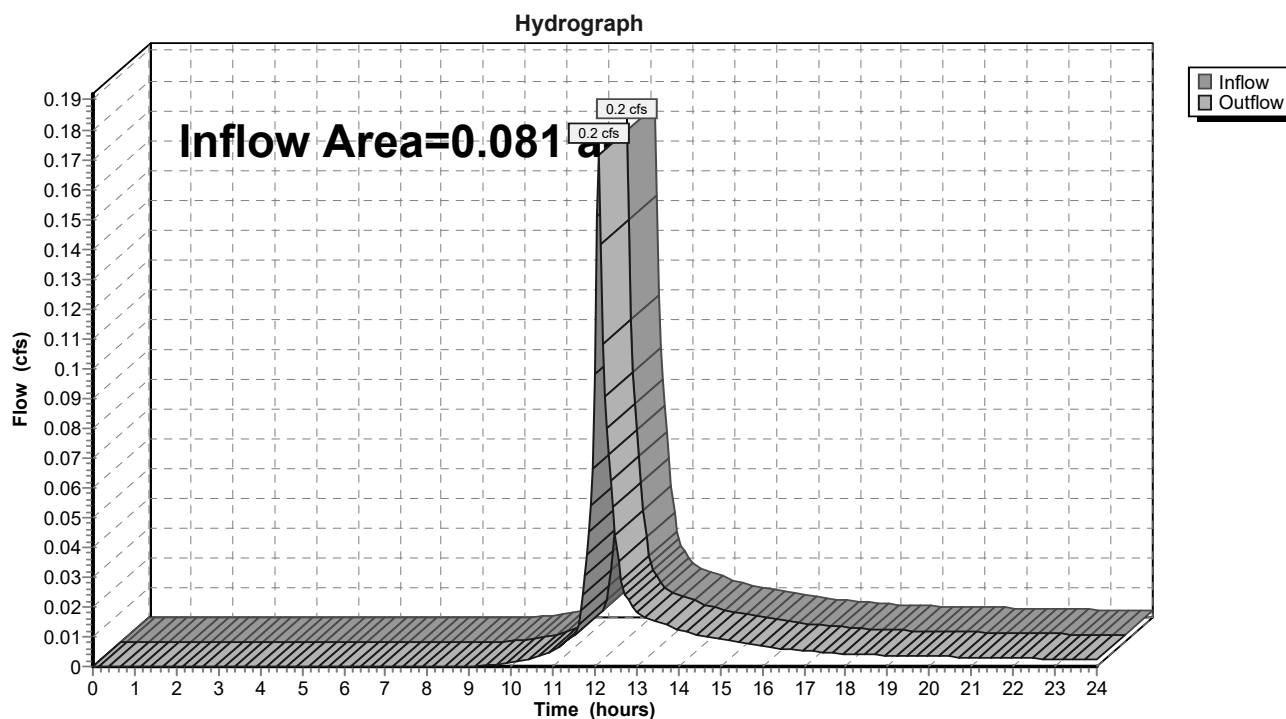
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-2: Design Point 2

Summary for Reach DP-3: Design Point 3

Inflow Area = 0.081 ac, 0.00% Impervious, Inflow Depth > 1.84" for 2-Yr 24 Hr event
Inflow = 0.2 cfs @ 12.10 hrs, Volume= 0.01 af
Outflow = 0.2 cfs @ 12.10 hrs, Volume= 0.01 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-3: Design Point 3

Summary for Pond EX-D1: Existing Depression-1

Inflow Area = 0.261 ac, 15.47% Impervious, Inflow Depth > 0.21" for 2-Yr 24 Hr event
 Inflow = 0.0 cfs @ 12.50 hrs, Volume= 0.00 af
 Outflow = 0.0 cfs @ 14.71 hrs, Volume= 0.00 af, Atten= 52%, Lag= 132.6 min
 Discarded = 0.0 cfs @ 14.71 hrs, Volume= 0.00 af
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.00 af
 Routed to Pond EX-D2 : Existing Depression-2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 79.19' @ 14.71 hrs Surf.Area= 126 sf Storage= 27 cf

Plug-Flow detention time= 51.5 min calculated for 0.00 af (98% of inflow)
 Center-of-Mass det. time= 43.6 min (1,032.8 - 989.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	78.80'	819 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
78.80	32	25.0	0	0	32
79.00	64	46.0	9	9	151
80.00	648	104.0	305	315	847
80.50	1,421	148.0	505	819	1,732

Device	Routing	Invert	Outlet Devices											
#1	Primary	80.10'	20.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65											
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#2	Discarded	78.80'	2.410 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.0 cfs @ 14.71 hrs HW=79.19' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=78.80' (Free Discharge)

↑**1=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Summary for Pond EX-D2: Existing Depression-2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth > 1.02" for 2-Yr 24 Hr event
 Inflow = 0.9 cfs @ 12.13 hrs, Volume= 0.08 af
 Outflow = 1.0 cfs @ 12.17 hrs, Volume= 0.08 af, Atten= 0%, Lag= 2.3 min
 Discarded = 0.1 cfs @ 12.17 hrs, Volume= 0.04 af
 Primary = 0.9 cfs @ 12.17 hrs, Volume= 0.03 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 76.59' @ 12.17 hrs Surf.Area= 1,103 sf Storage= 507 cf

Plug-Flow detention time= 66.2 min calculated for 0.07 af (96% of inflow)
 Center-of-Mass det. time= 47.8 min (905.8 - 858.1)

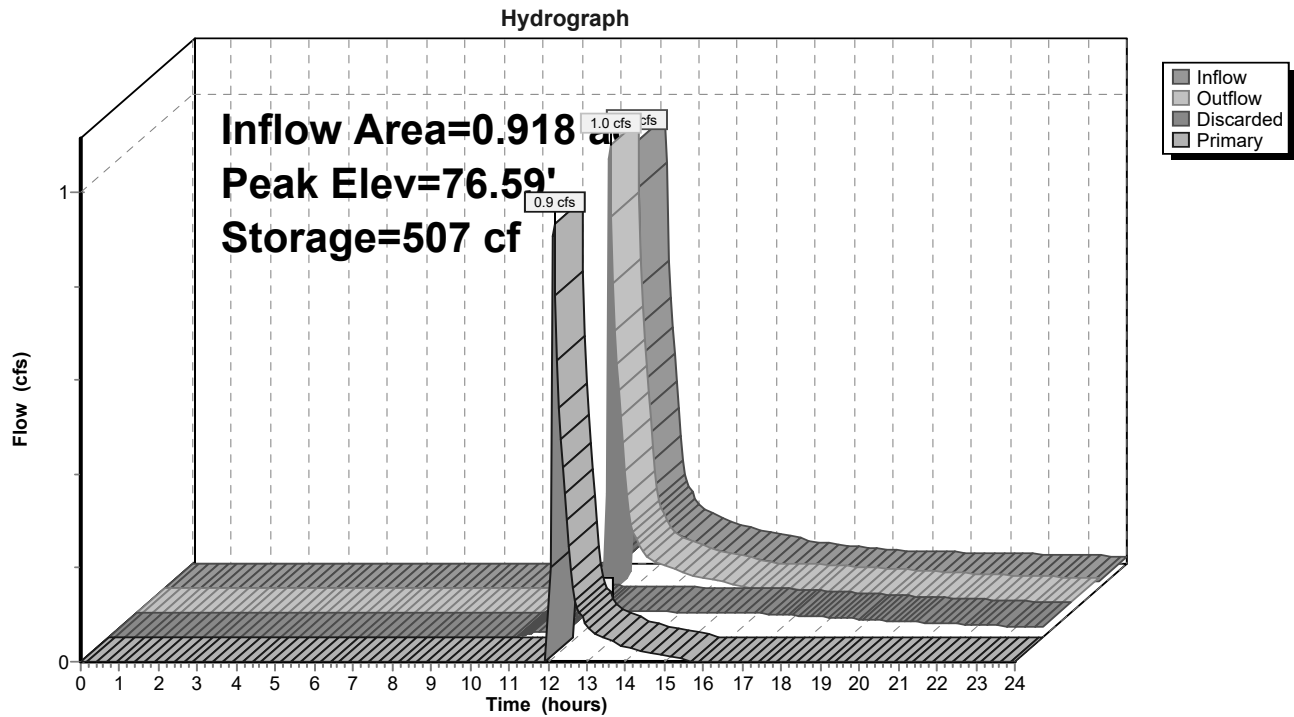
Volume	Invert	Avail.Storage	Storage Description		
#1	75.60'	519 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.60	172	80.0	0	0	172
76.00	345	115.0	101	101	717
76.60	1,120	212.0	417	519	3,243

Device	Routing	Invert	Outlet Devices											
#1	Primary	76.50'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65											
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#2	Discarded	75.60'	2.410 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.1 cfs @ 12.17 hrs HW=76.58' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.9 cfs @ 12.17 hrs HW=76.58' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.9 cfs @ 0.7 fps)

Pond EX-D2: Existing Depression-2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentSC-1: Subcatchment1 Runoff Area=7,364 sf 45.00% Impervious Runoff Depth>2.76"
 Flow Length=52' Slope=0.0200 ' / ' Tc=6.0 min CN=66 Runoff=0.5 cfs 0.04 af

SubcatchmentSC-2: Subcatchment2 Runoff Area=11,386 sf 15.47% Impervious Runoff Depth>1.05"
 Flow Length=212' Tc=11.4 min CN=46 Runoff=0.2 cfs 0.02 af

SubcatchmentSC-2.1: Subcatchment2.1 Runoff Area=28,605 sf 42.28% Impervious Runoff Depth>3.24"
 Flow Length=225' Tc=8.2 min CN=71 Runoff=2.3 cfs 0.18 af

SubcatchmentSC-3: Subcatchment3 Runoff Area=3,546 sf 0.00% Impervious Runoff Depth>3.85"
 Flow Length=57' Tc=6.0 min CN=77 Runoff=0.4 cfs 0.03 af

Reach DP-1: Design Point 1 Inflow=0.5 cfs 0.04 af
 Outflow=0.5 cfs 0.04 af

Reach DP-2: Design Point 2 Inflow=2.2 cfs 0.11 af
 Outflow=2.2 cfs 0.11 af

Reach DP-3: Design Point 3 Inflow=0.4 cfs 0.03 af
 Outflow=0.4 cfs 0.03 af

Pond EX-D1: Existing Depression-1 Peak Elev=79.98' Storage=301 cf Inflow=0.2 cfs 0.02 af
 Discarded=0.0 cfs 0.02 af Primary=0.0 cfs 0.00 af Outflow=0.0 cfs 0.02 af

Pond EX-D2: Existing Depression-2 Peak Elev=76.66' Storage=519 cf Inflow=2.3 cfs 0.18 af
 Discarded=0.1 cfs 0.06 af Primary=2.2 cfs 0.11 af Outflow=2.3 cfs 0.17 af

Total Runoff Area = 1.169 ac Runoff Volume = 0.27 af Average Runoff Depth = 2.73"
66.27% Pervious = 0.774 ac 33.73% Impervious = 0.394 ac

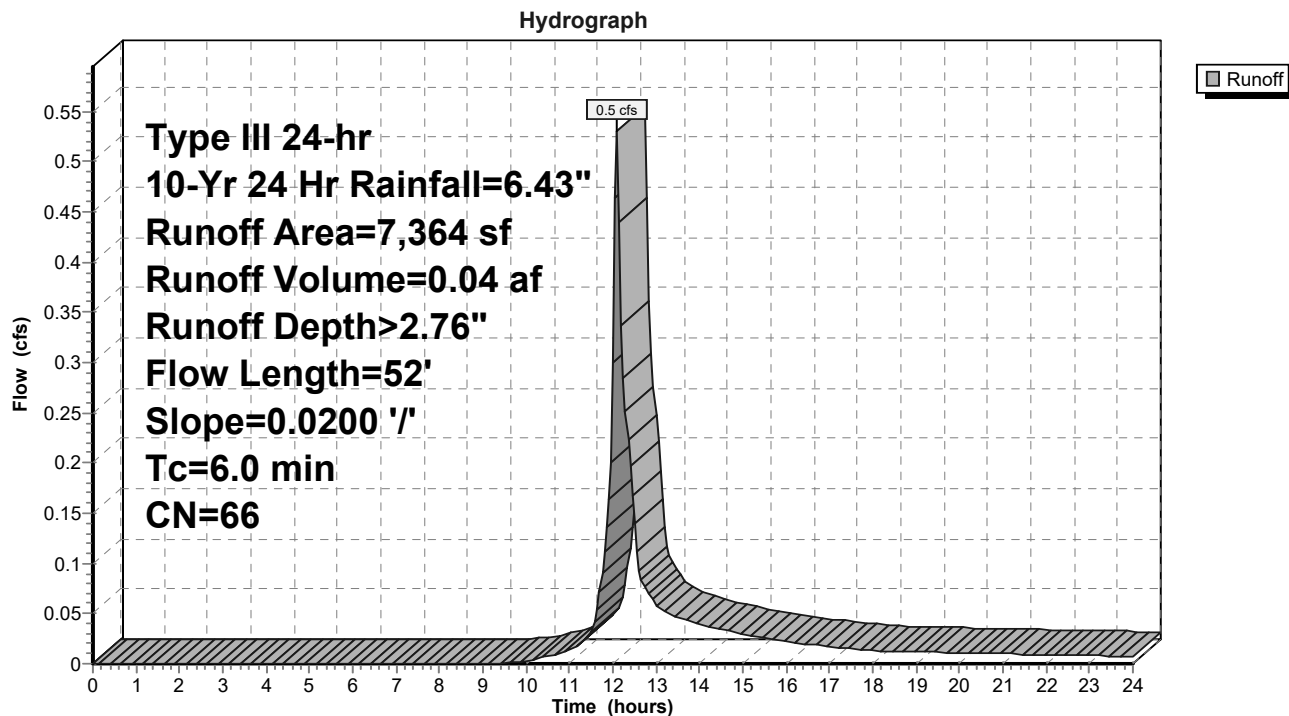
Summary for Subcatchment SC-1: Subcatchment 1

Runoff = 0.5 cfs @ 12.10 hrs, Volume= 0.04 af, Depth> 2.76"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

Area (sf)	CN	Description
3,644	39	>75% Grass cover, Good, HSG A
* 1,684	98	Driveway/Walkways
* 1,412	98	Roof
* 218	98	Roof
406	39	>75% Grass cover, Good, HSG A
7,364	66	Weighted Average
4,050		55.00% Pervious Area
3,314		45.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	24	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
0.4	26	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.04"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8					Direct Entry, Min. Engineering Practice
6.0	52	Total			

Subcatchment SC-1: Subcatchment 1

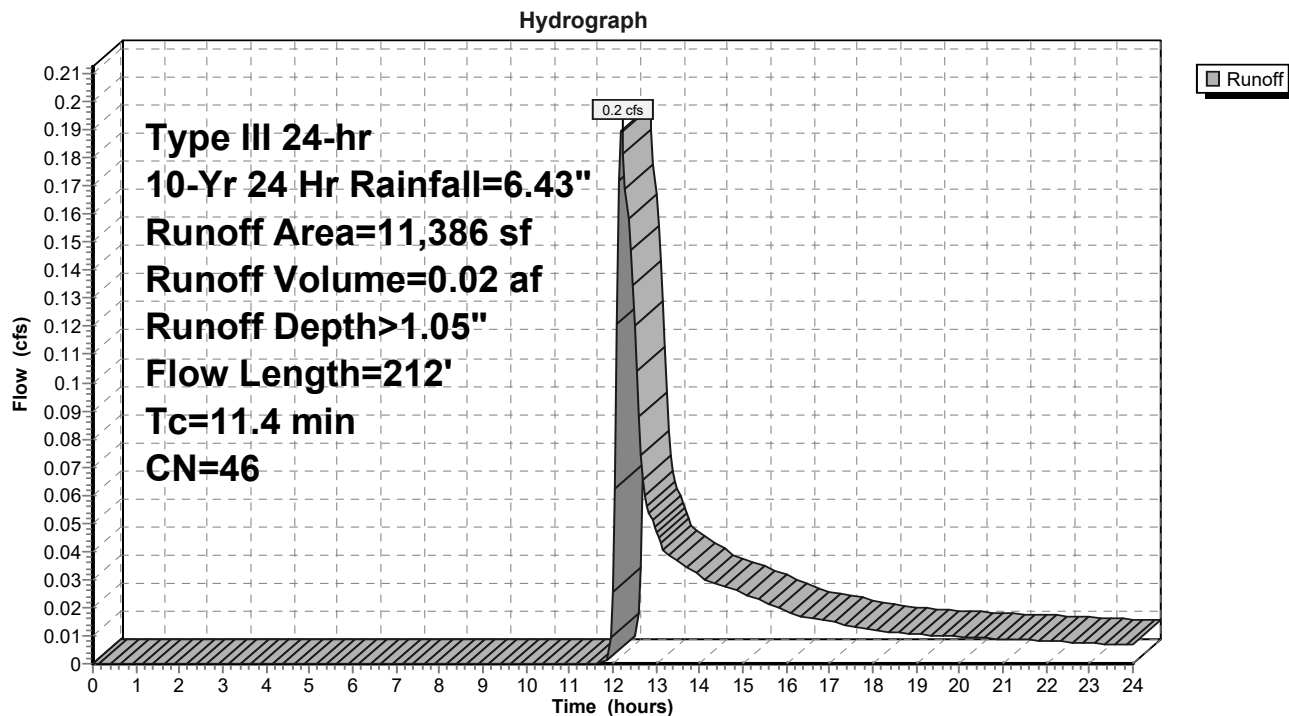
Summary for Subcatchment SC-2: Subcatchment 2

Runoff = 0.2 cfs @ 12.21 hrs, Volume= 0.02 af, Depth> 1.05"
 Routed to Pond EX-D1 : Existing Depression-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

Area (sf)	CN	Description
3,752	39	>75% Grass cover, Good, HSG A
23	77	Woods, Good, HSG D
* 811	98	Driveway/Walkways/Patios
* 735	98	Roof
3,208	30	Woods, Good, HSG A
* 23	98	Bulkheads
* 192	98	Shed
46	96	Gravel surface, HSG A
2,596	39	>75% Grass cover, Good, HSG A
11,386	46	Weighted Average
9,625		84.53% Pervious Area
1,761		15.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
7.1	29	0.0200	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.7	50	0.0600	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	76	0.1050	1.6		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	36	0.2000	2.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	212	Total			

Subcatchment SC-2: Subcatchment 2

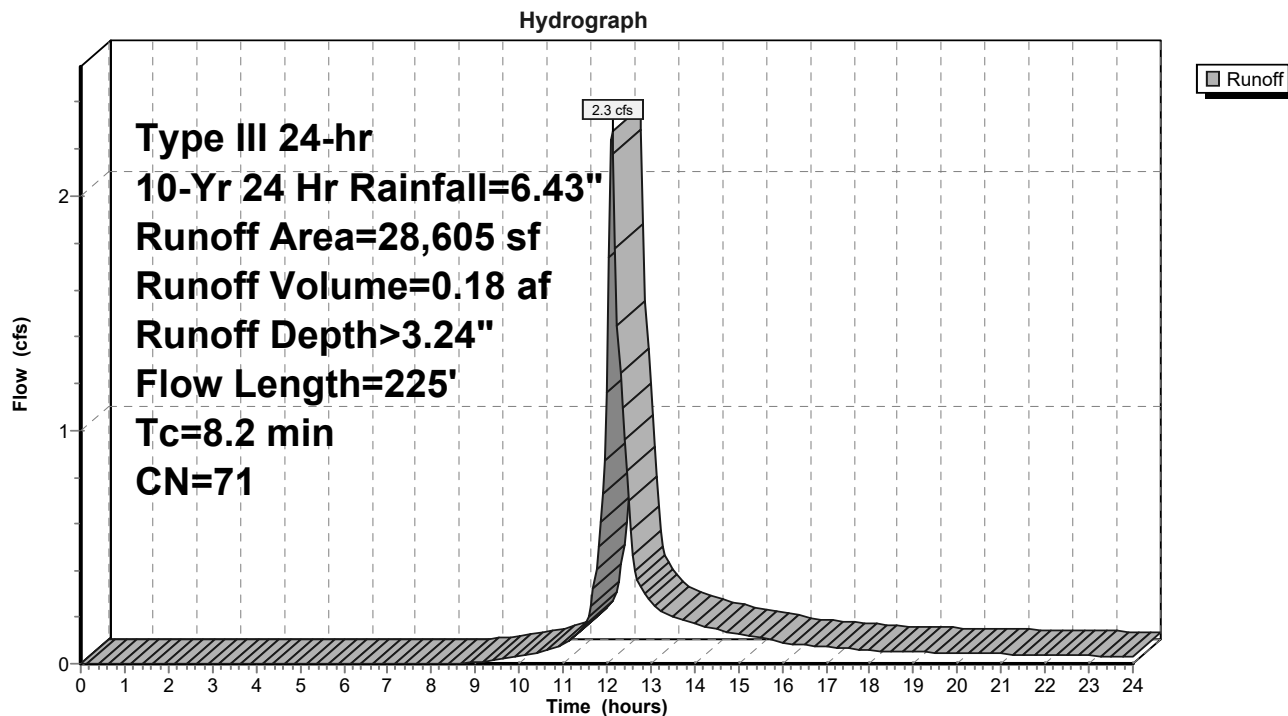
Summary for Subcatchment SC-2.1: Subcatchment 2.1

Runoff = 2.3 cfs @ 12.12 hrs, Volume= 0.18 af, Depth> 3.24"
 Routed to Pond EX-D2 : Existing Depression-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

Area (sf)	CN	Description
0	39	>75% Grass cover, Good, HSG A
76	80	>75% Grass cover, Good, HSG D
5,371	77	Woods, Good, HSG D
* 9,310	98	Driveway/Walkways/Patios
* 2,765	98	Roof
4,626	30	Woods, Good, HSG A
* 20	98	Bulkheads
597	96	Gravel surface, HSG A
5,840	39	>75% Grass cover, Good, HSG A
28,605	71	Weighted Average
16,510		57.72% Pervious Area
12,095		42.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	41	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
1.8	9	0.0560	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
1.7	119	0.0560	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	56	0.2210	2.4		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	225	Total			

Subcatchment SC-2.1: Subcatchment 2.1

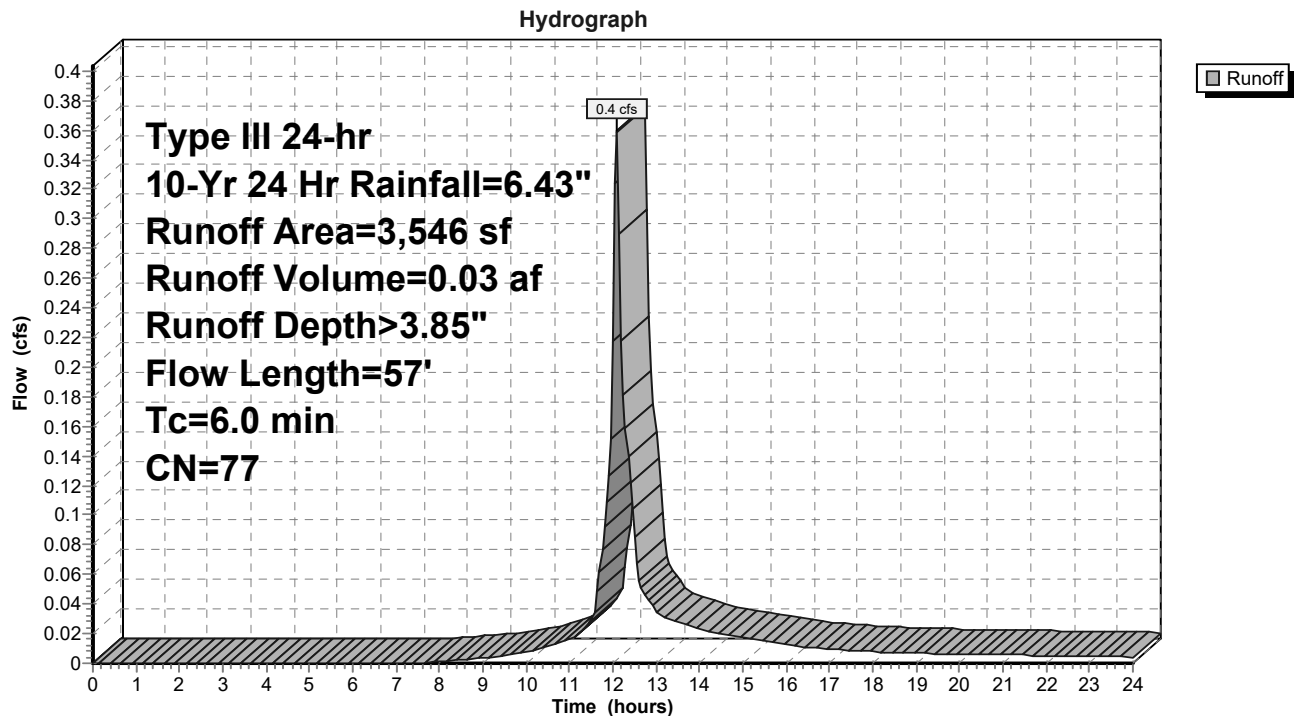
Summary for Subcatchment SC-3: Subcatchment 3

Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Depth> 3.85"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

Area (sf)	CN	Description
3,546	77	Woods, Good, HSG D
3,546		100.00% Pervious Area

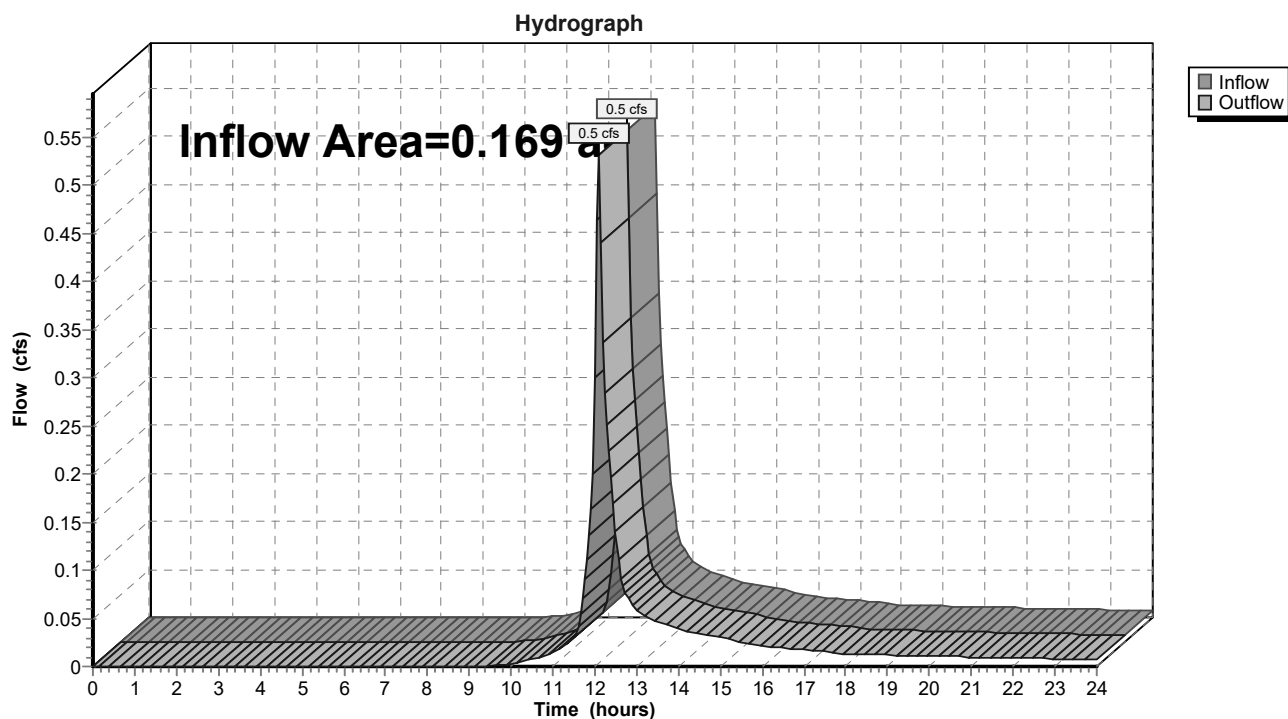
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.1170	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.2	7	0.0200	0.7		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.6	57	Total, Increased to minimum Tc = 6.0 min			

Subcatchment SC-3: Subcatchment 3

Summary for Reach DP-1: Design Point 1

Inflow Area = 0.169 ac, 45.00% Impervious, Inflow Depth > 2.76" for 10-Yr 24 Hr event
Inflow = 0.5 cfs @ 12.10 hrs, Volume= 0.04 af
Outflow = 0.5 cfs @ 12.10 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min

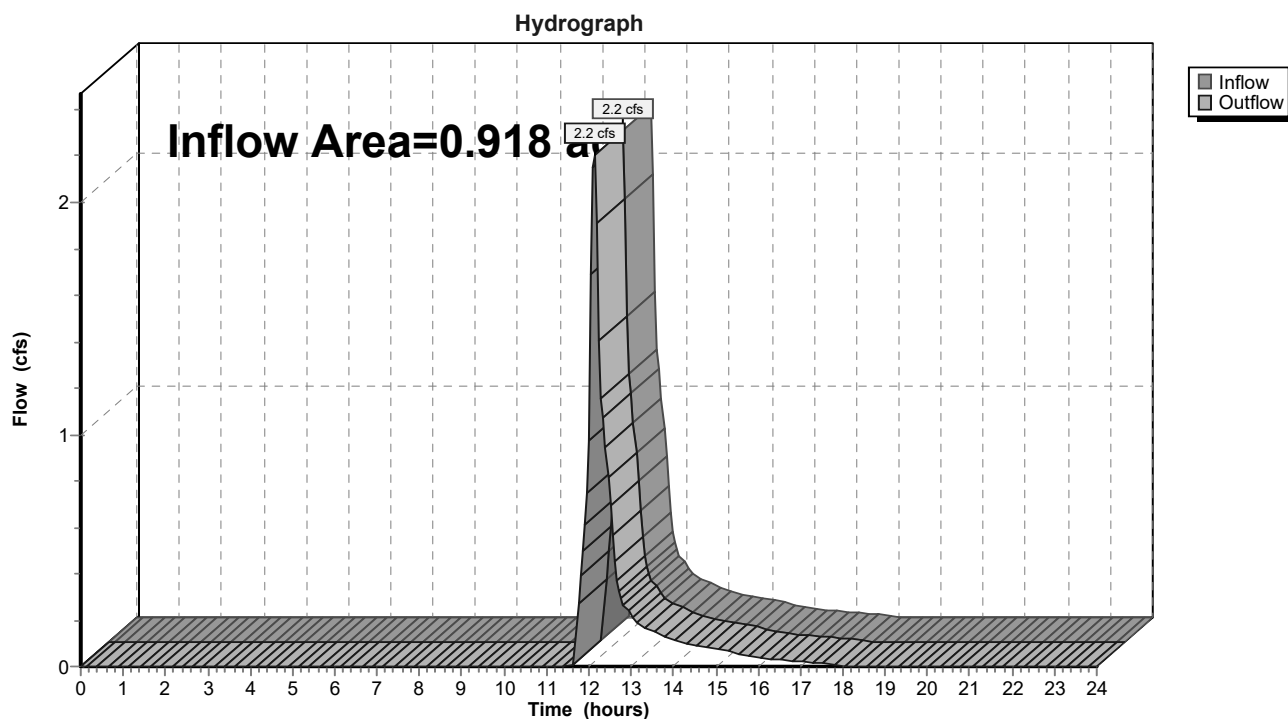
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1

Summary for Reach DP-2: Design Point 2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth = 1.48" for 10-Yr 24 Hr event
Inflow = 2.2 cfs @ 12.12 hrs, Volume= 0.11 af
Outflow = 2.2 cfs @ 12.12 hrs, Volume= 0.11 af, Atten= 0%, Lag= 0.0 min

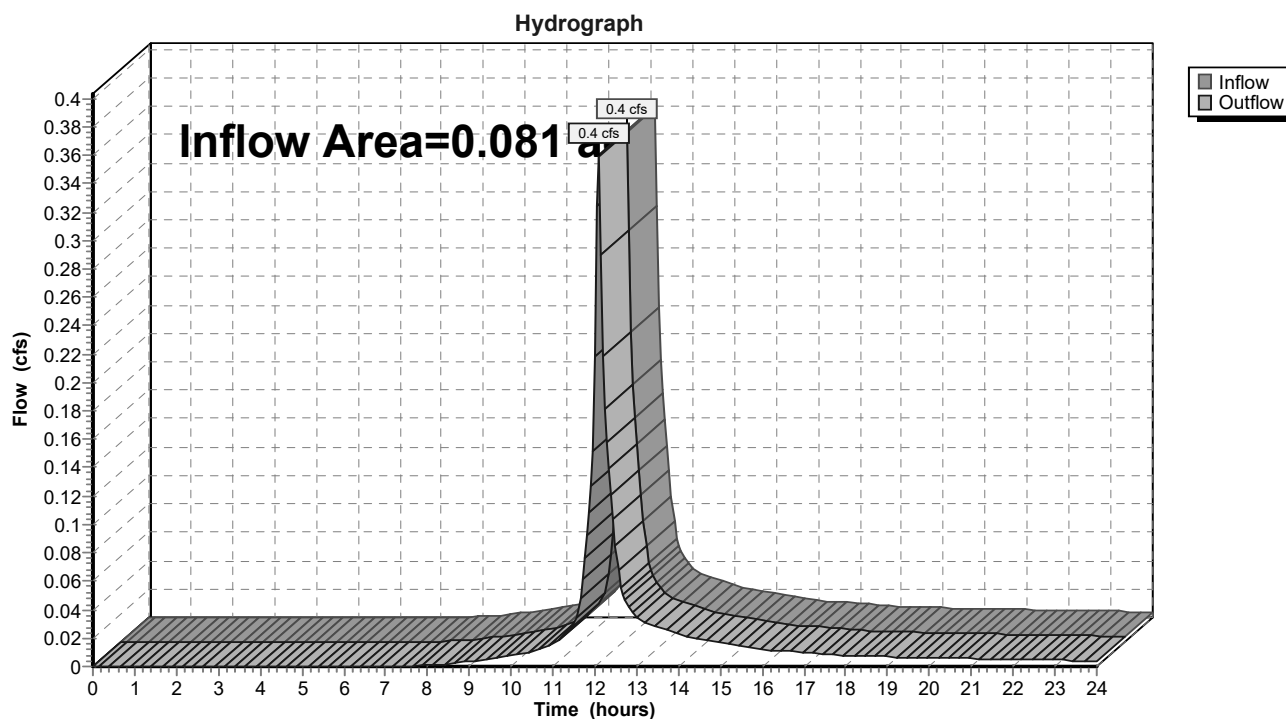
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-2: Design Point 2

Summary for Reach DP-3: Design Point 3

Inflow Area = 0.081 ac, 0.00% Impervious, Inflow Depth > 3.85" for 10-Yr 24 Hr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-3: Design Point 3

Summary for Pond EX-D1: Existing Depression-1

Inflow Area = 0.261 ac, 15.47% Impervious, Inflow Depth > 1.05" for 10-Yr 24 Hr event
 Inflow = 0.2 cfs @ 12.21 hrs, Volume= 0.02 af
 Outflow = 0.0 cfs @ 13.66 hrs, Volume= 0.02 af, Atten= 81%, Lag= 87.0 min
 Discarded = 0.0 cfs @ 13.66 hrs, Volume= 0.02 af
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.00 af
 Routed to Pond EX-D2 : Existing Depression-2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 79.98' @ 13.66 hrs Surf.Area= 629 sf Storage= 301 cf

Plug-Flow detention time= 118.9 min calculated for 0.02 af (96% of inflow)
 Center-of-Mass det. time= 99.6 min (1,006.6 - 907.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	78.80'	819 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
78.80	32	25.0	0	0	32
79.00	64	46.0	9	9	151
80.00	648	104.0	305	315	847
80.50	1,421	148.0	505	819	1,732

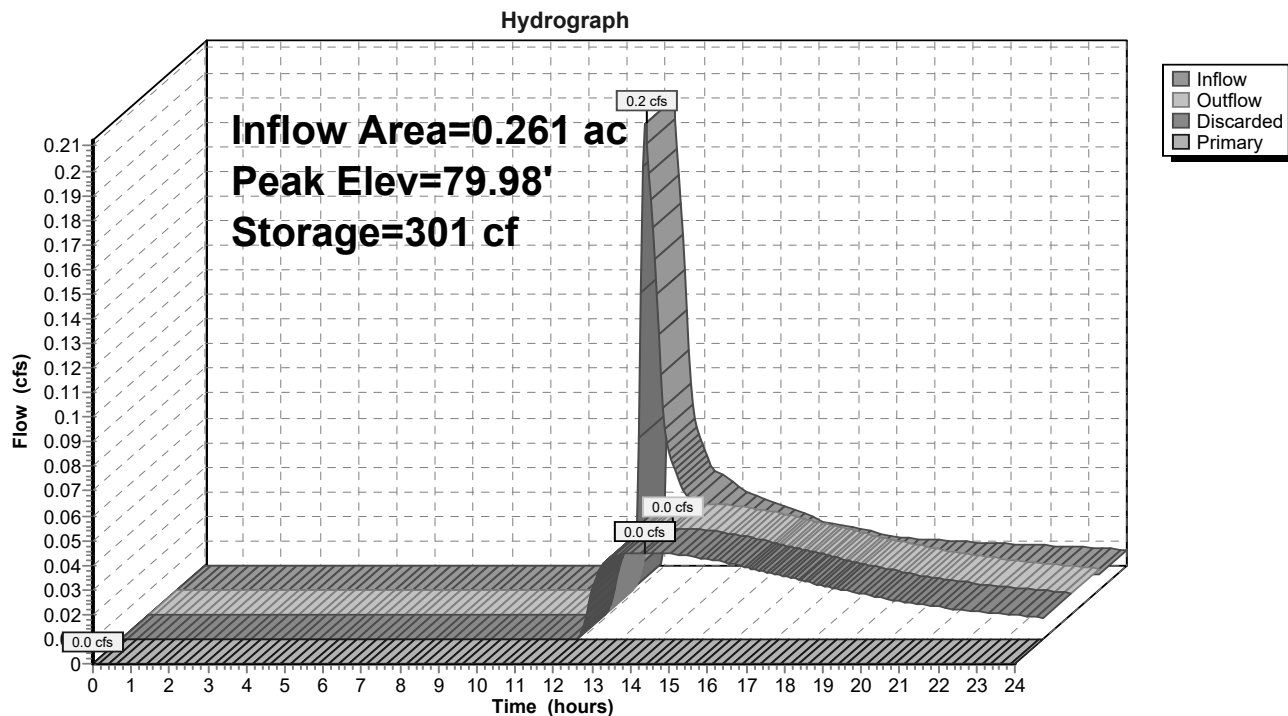
Device	Routing	Invert	Outlet Devices											
#1	Primary	80.10'	20.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65											
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#2	Discarded	78.80'	2.410 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.0 cfs @ 13.66 hrs HW=79.98' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=78.80' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond EX-D1: Existing Depression-1

Summary for Pond EX-D2: Existing Depression-2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth > 2.32" for 10-Yr 24 Hr event
 Inflow = 2.3 cfs @ 12.12 hrs, Volume= 0.18 af
 Outflow = 2.3 cfs @ 12.12 hrs, Volume= 0.17 af, Atten= 1%, Lag= 0.2 min
 Discarded = 0.1 cfs @ 12.05 hrs, Volume= 0.06 af
 Primary = 2.2 cfs @ 12.12 hrs, Volume= 0.11 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 76.66' @ 12.12 hrs Surf.Area= 1,120 sf Storage= 519 cf

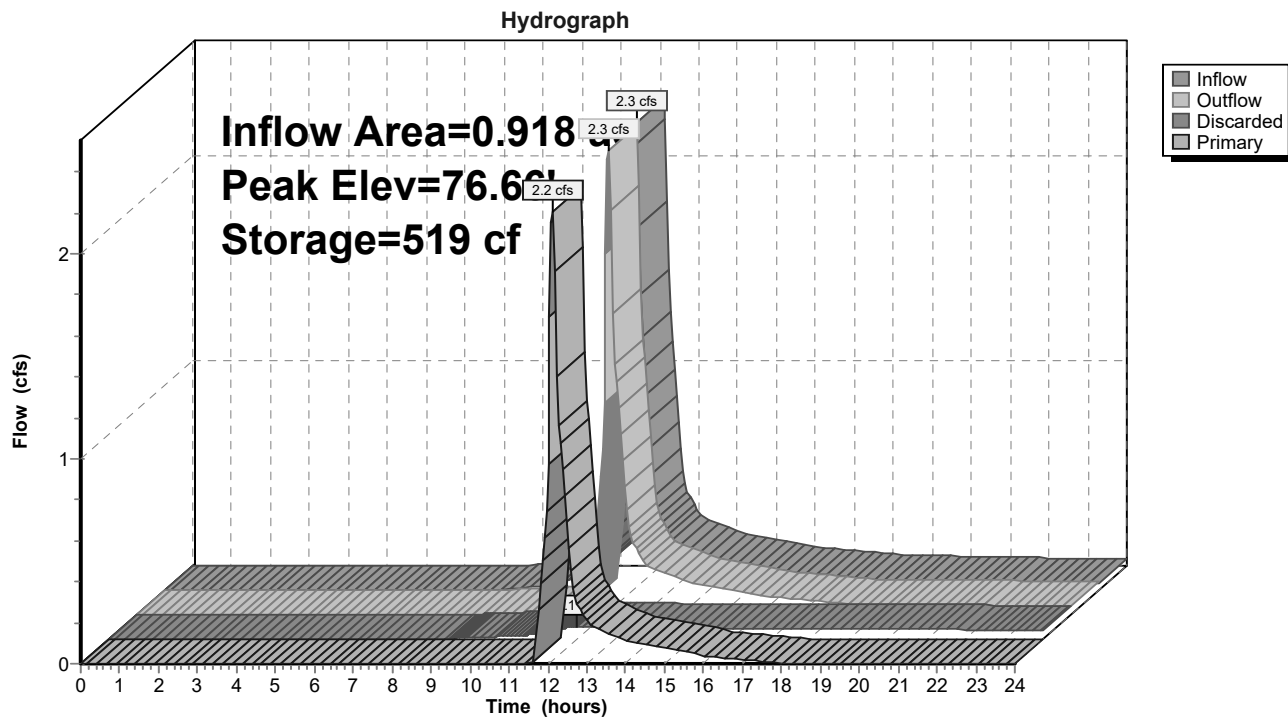
Plug-Flow detention time= 39.5 min calculated for 0.17 af (96% of inflow)
 Center-of-Mass det. time= 19.9 min (853.6 - 833.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	75.60'	519 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.60	172	80.0	0	0	172
76.00	345	115.0	101	101	717
76.60	1,120	212.0	417	519	3,243

Device	Routing	Invert	Outlet Devices											
#1	Primary	76.50'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65											
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#2	Discarded	75.60'	2.410 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.1 cfs @ 12.05 hrs HW=76.63' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=2.1 cfs @ 12.12 hrs HW=76.66' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 2.1 cfs @ 0.9 fps)

Pond EX-D2: Existing Depression-2

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentSC-1: Subcatchment1 Runoff Area=7,364 sf 45.00% Impervious Runoff Depth>5.42"
 Flow Length=52' Slope=0.0200 ' / ' Tc=6.0 min CN=66 Runoff=1.1 cfs 0.08 af

SubcatchmentSC-2: Subcatchment2 Runoff Area=11,386 sf 15.47% Impervious Runoff Depth>2.82"
 Flow Length=212' Tc=11.4 min CN=46 Runoff=0.7 cfs 0.06 af

SubcatchmentSC-2.1: Subcatchment2.1 Runoff Area=28,605 sf 42.28% Impervious Runoff Depth>6.07"
 Flow Length=225' Tc=8.2 min CN=71 Runoff=4.3 cfs 0.33 af

SubcatchmentSC-3: Subcatchment3 Runoff Area=3,546 sf 0.00% Impervious Runoff Depth>6.84"
 Flow Length=57' Tc=6.0 min CN=77 Runoff=0.6 cfs 0.05 af

Reach DP-1: Design Point 1 Inflow=1.1 cfs 0.08 af
 Outflow=1.1 cfs 0.08 af

Reach DP-2: Design Point 2 Inflow=4.3 cfs 0.28 af
 Outflow=4.3 cfs 0.28 af

Reach DP-3: Design Point 3 Inflow=0.6 cfs 0.05 af
 Outflow=0.6 cfs 0.05 af

Pond EX-D1: Existing Depression-1 Peak Elev=80.15' Storage=430 cf Inflow=0.7 cfs 0.06 af
 Discarded=0.0 cfs 0.04 af Primary=0.6 cfs 0.02 af Outflow=0.6 cfs 0.06 af

Pond EX-D2: Existing Depression-2 Peak Elev=76.74' Storage=519 cf Inflow=4.3 cfs 0.35 af
 Discarded=0.1 cfs 0.07 af Primary=4.3 cfs 0.28 af Outflow=4.3 cfs 0.35 af

Total Runoff Area = 1.169 ac Runoff Volume = 0.52 af Average Runoff Depth = 5.30"
66.27% Pervious = 0.774 ac 33.73% Impervious = 0.394 ac

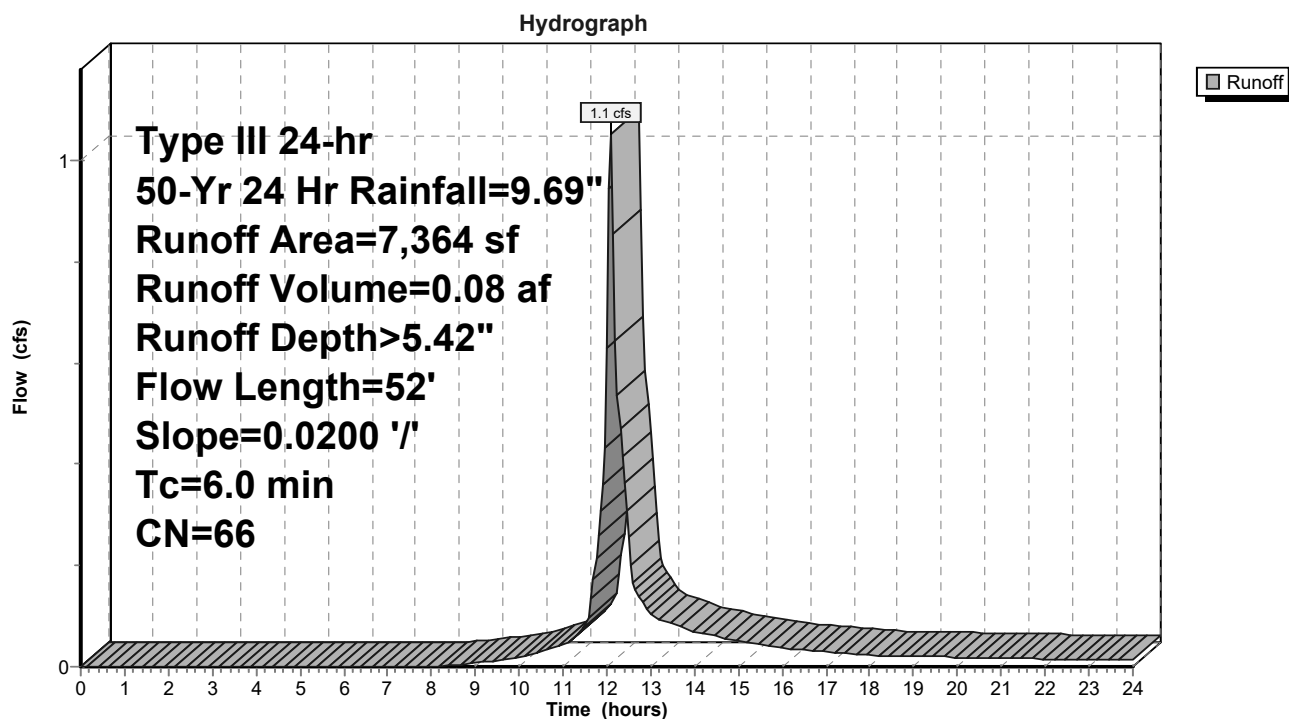
Summary for Subcatchment SC-1: Subcatchment 1

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 0.08 af, Depth> 5.42"
Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

Area (sf)	CN	Description
3,644	39	>75% Grass cover, Good, HSG A
* 1,684	98	Driveway/Walkways
* 1,412	98	Roof
* 218	98	Roof
406	39	>75% Grass cover, Good, HSG A
7,364	66	Weighted Average
4,050		55.00% Pervious Area
3,314		45.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	24	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
0.4	26	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.04"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8					Direct Entry, Min. Engineering Practice
6.0	52	Total			

Subcatchment SC-1: Subcatchment 1

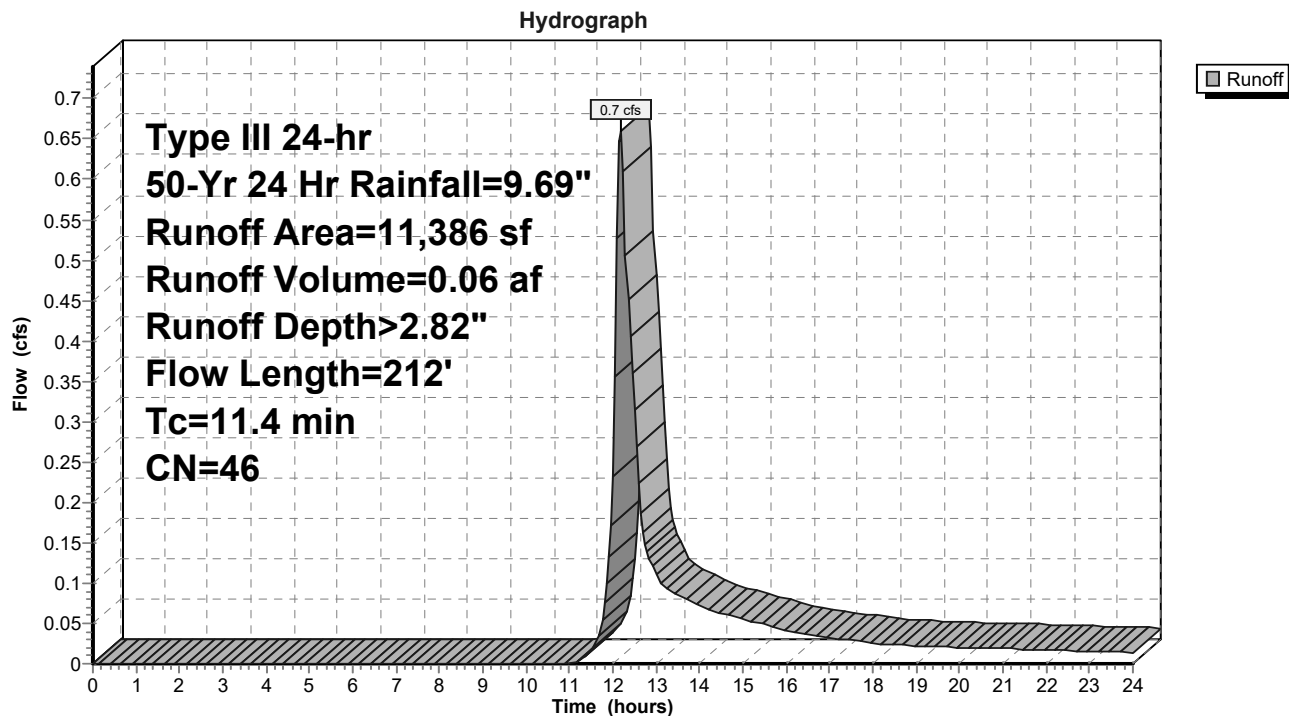
Summary for Subcatchment SC-2: Subcatchment 2

Runoff = 0.7 cfs @ 12.17 hrs, Volume= 0.06 af, Depth> 2.82"
 Routed to Pond EX-D1 : Existing Depression-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

Area (sf)	CN	Description
3,752	39	>75% Grass cover, Good, HSG A
23	77	Woods, Good, HSG D
* 811	98	Driveway/Walkways/Patios
* 735	98	Roof
3,208	30	Woods, Good, HSG A
* 23	98	Bulkheads
* 192	98	Shed
46	96	Gravel surface, HSG A
2,596	39	>75% Grass cover, Good, HSG A
11,386	46	Weighted Average
9,625		84.53% Pervious Area
1,761		15.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
7.1	29	0.0200	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.7	50	0.0600	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	76	0.1050	1.6		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	36	0.2000	2.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	212	Total			

Subcatchment SC-2: Subcatchment 2

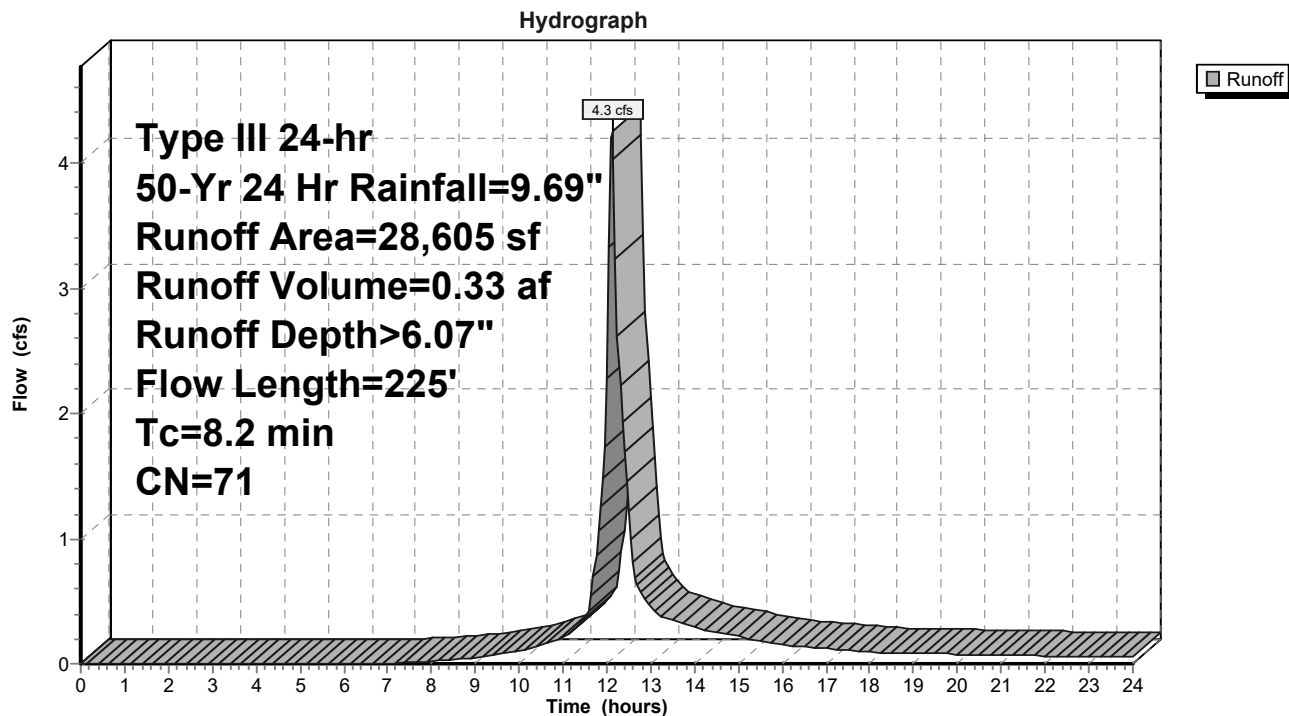
Summary for Subcatchment SC-2.1: Subcatchment 2.1

Runoff = 4.3 cfs @ 12.12 hrs, Volume= 0.33 af, Depth> 6.07"
 Routed to Pond EX-D2 : Existing Depression-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

Area (sf)	CN	Description
0	39	>75% Grass cover, Good, HSG A
76	80	>75% Grass cover, Good, HSG D
5,371	77	Woods, Good, HSG D
* 9,310	98	Driveway/Walkways/Patios
* 2,765	98	Roof
4,626	30	Woods, Good, HSG A
* 20	98	Bulkheads
597	96	Gravel surface, HSG A
5,840	39	>75% Grass cover, Good, HSG A
28,605	71	Weighted Average
16,510		57.72% Pervious Area
12,095		42.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	41	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
1.8	9	0.0560	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
1.7	119	0.0560	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	56	0.2210	2.4		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	225	Total			

Subcatchment SC-2.1: Subcatchment 2.1

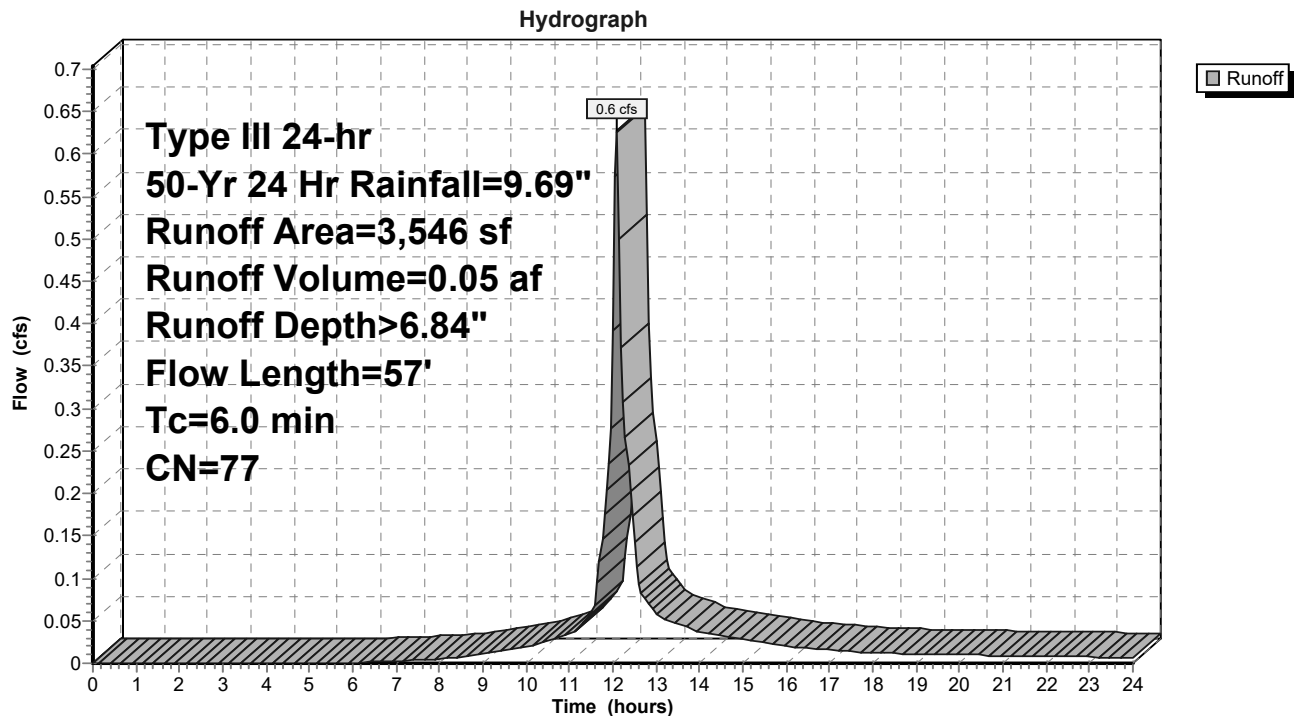
Summary for Subcatchment SC-3: Subcatchment 3

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af, Depth> 6.84"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

Area (sf)	CN	Description
3,546	77	Woods, Good, HSG D
3,546		100.00% Pervious Area

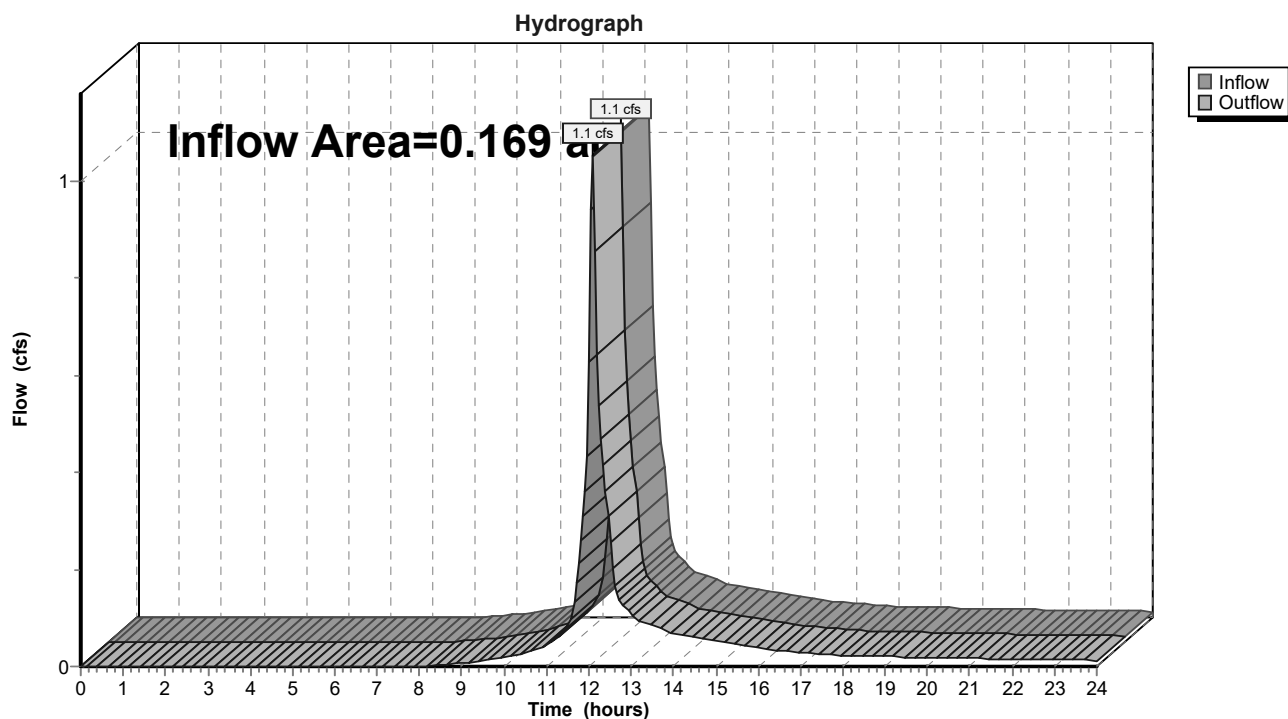
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.1170	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.2	7	0.0200	0.7		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.6	57	Total, Increased to minimum Tc = 6.0 min			

Subcatchment SC-3: Subcatchment 3

Summary for Reach DP-1: Design Point 1

Inflow Area = 0.169 ac, 45.00% Impervious, Inflow Depth > 5.42" for 50-Yr 24 Hr event
Inflow = 1.1 cfs @ 12.09 hrs, Volume= 0.08 af
Outflow = 1.1 cfs @ 12.09 hrs, Volume= 0.08 af, Atten= 0%, Lag= 0.0 min

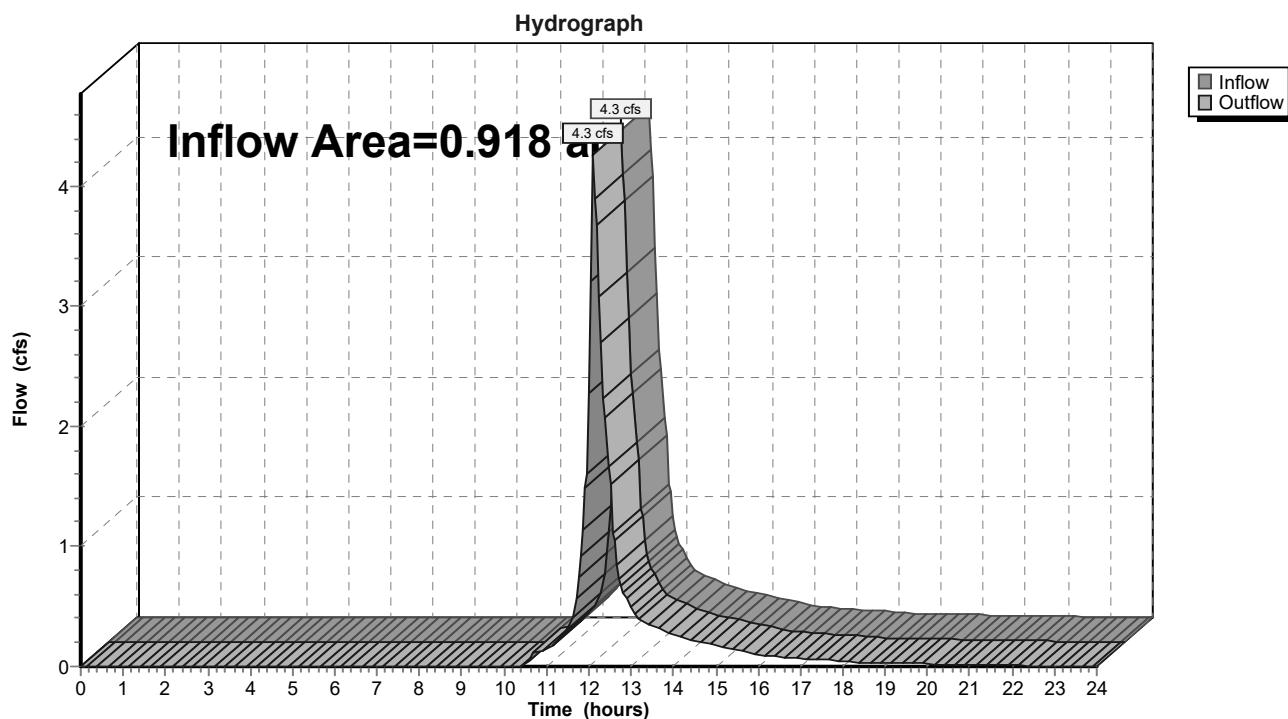
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1

Summary for Reach DP-2: Design Point 2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth = 3.63" for 50-Yr 24 Hr event
Inflow = 4.3 cfs @ 12.11 hrs, Volume= 0.28 af
Outflow = 4.3 cfs @ 12.11 hrs, Volume= 0.28 af, Atten= 0%, Lag= 0.0 min

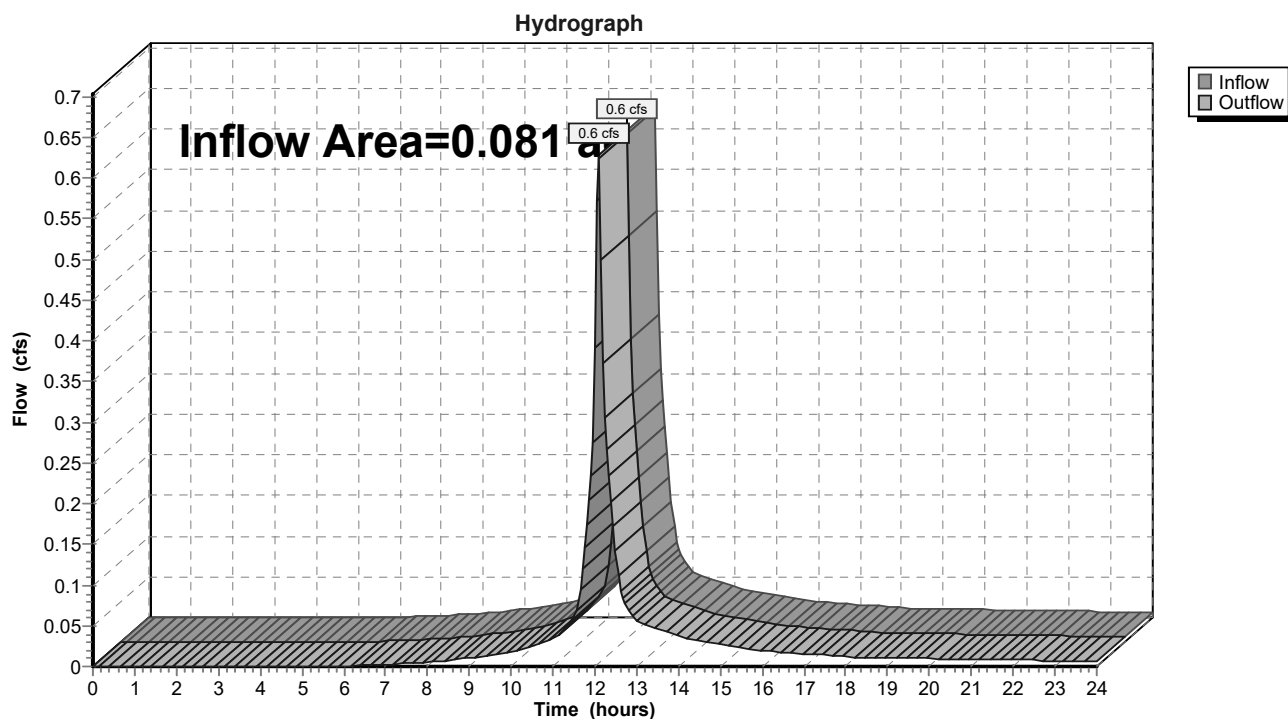
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-2: Design Point 2

Summary for Reach DP-3: Design Point 3

Inflow Area = 0.081 ac, 0.00% Impervious, Inflow Depth > 6.84" for 50-Yr 24 Hr event
Inflow = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af
Outflow = 0.6 cfs @ 12.09 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-3: Design Point 3

Summary for Pond EX-D1: Existing Depression-1

Inflow Area = 0.261 ac, 15.47% Impervious, Inflow Depth > 2.82" for 50-Yr 24 Hr event
 Inflow = 0.7 cfs @ 12.17 hrs, Volume= 0.06 af
 Outflow = 0.6 cfs @ 12.25 hrs, Volume= 0.06 af, Atten= 3%, Lag= 4.7 min
 Discarded = 0.0 cfs @ 12.25 hrs, Volume= 0.04 af
 Primary = 0.6 cfs @ 12.25 hrs, Volume= 0.02 af
 Routed to Pond EX-D2 : Existing Depression-2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.15' @ 12.25 hrs Surf.Area= 855 sf Storage= 430 cf

Plug-Flow detention time= 81.0 min calculated for 0.06 af (95% of inflow)
 Center-of-Mass det. time= 55.8 min (927.7 - 872.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	78.80'	819 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
78.80	32	25.0	0	0	32
79.00	64	46.0	9	9	151
80.00	648	104.0	305	315	847
80.50	1,421	148.0	505	819	1,732

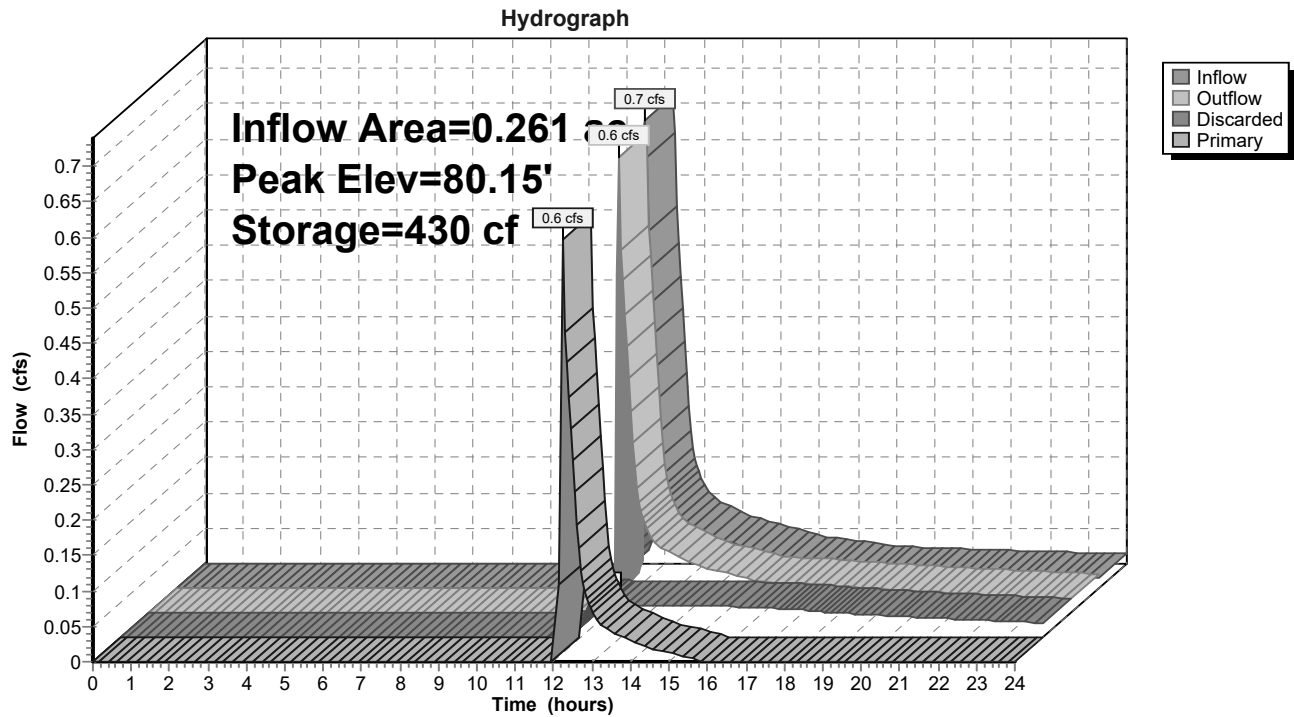
Device	Routing	Invert	Outlet Devices											
#1	Primary	80.10'	20.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65											
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#2	Discarded	78.80'	2.410 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.0 cfs @ 12.25 hrs HW=80.15' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.6 cfs @ 12.25 hrs HW=80.15' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.6 cfs @ 0.5 fps)

Pond EX-D1: Existing Depression-1

Summary for Pond EX-D2: Existing Depression-2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth > 4.64" for 50-Yr 24 Hr event
 Inflow = 4.3 cfs @ 12.12 hrs, Volume= 0.35 af
 Outflow = 4.3 cfs @ 12.11 hrs, Volume= 0.35 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 11.85 hrs, Volume= 0.07 af
 Primary = 4.3 cfs @ 12.11 hrs, Volume= 0.28 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 76.74' @ 12.11 hrs Surf.Area= 1,120 sf Storage= 519 cf

Plug-Flow detention time= 23.1 min calculated for 0.34 af (97% of inflow)
 Center-of-Mass det. time= 7.9 min (820.7 - 812.8)

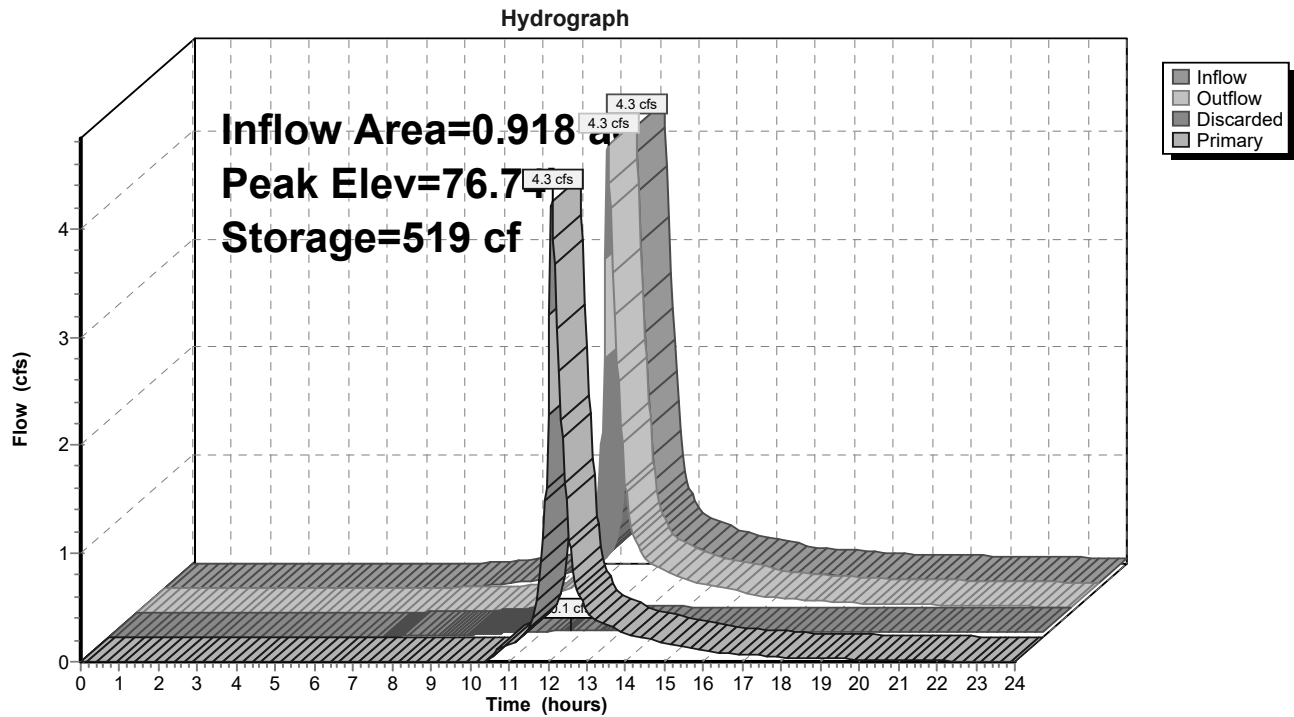
Volume	Invert	Avail.Storage	Storage Description		
#1	75.60'	519 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.60	172	80.0	0	0	172
76.00	345	115.0	101	101	717
76.60	1,120	212.0	417	519	3,243

Device	Routing	Invert	Outlet Devices												
#1	Primary	76.50'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir												
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00												
			2.50 3.00 3.50 4.00 4.50 5.00 5.50												
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65												
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88												
#2	Discarded	75.60'	2.410 in/hr Exfiltration over Surface area												

Discarded OutFlow Max=0.1 cfs @ 11.85 hrs HW=76.60' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=4.1 cfs @ 12.11 hrs HW=76.74' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 4.1 cfs @ 1.2 fps)

Pond EX-D2: Existing Depression-2



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentSC-1: Subcatchment1 Runoff Area=7,364 sf 45.00% Impervious Runoff Depth>7.01"
 Flow Length=52' Slope=0.0200 '/' Tc=6.0 min CN=66 Runoff=1.4 cfs 0.10 af

SubcatchmentSC-2: Subcatchment2 Runoff Area=11,386 sf 15.47% Impervious Runoff Depth>4.00"
 Flow Length=212' Tc=11.4 min CN=46 Runoff=1.0 cfs 0.09 af

SubcatchmentSC-2.1: Subcatchment2.1 Runoff Area=28,605 sf 42.28% Impervious Runoff Depth>7.72"
 Flow Length=225' Tc=8.2 min CN=71 Runoff=5.4 cfs 0.42 af

SubcatchmentSC-3: Subcatchment3 Runoff Area=3,546 sf 0.00% Impervious Runoff Depth>8.55"
 Flow Length=57' Tc=6.0 min CN=77 Runoff=0.8 cfs 0.06 af

Reach DP-1: Design Point 1 Inflow=1.4 cfs 0.10 af
 Outflow=1.4 cfs 0.10 af

Reach DP-2: Design Point 2 Inflow=6.0 cfs 0.38 af
 Outflow=6.0 cfs 0.38 af

Reach DP-3: Design Point 3 Inflow=0.8 cfs 0.06 af
 Outflow=0.8 cfs 0.06 af

Pond EX-D1: Existing Depression-1 Peak Elev=80.18' Storage=450 cf Inflow=1.0 cfs 0.09 af
 Discarded=0.0 cfs 0.04 af Primary=1.0 cfs 0.04 af Outflow=1.0 cfs 0.08 af

Pond EX-D2: Existing Depression-2 Peak Elev=76.80' Storage=519 cf Inflow=6.1 cfs 0.47 af
 Discarded=0.1 cfs 0.07 af Primary=6.0 cfs 0.38 af Outflow=6.1 cfs 0.46 af

Total Runoff Area = 1.169 ac Runoff Volume = 0.67 af Average Runoff Depth = 6.84"
66.27% Pervious = 0.774 ac 33.73% Impervious = 0.394 ac

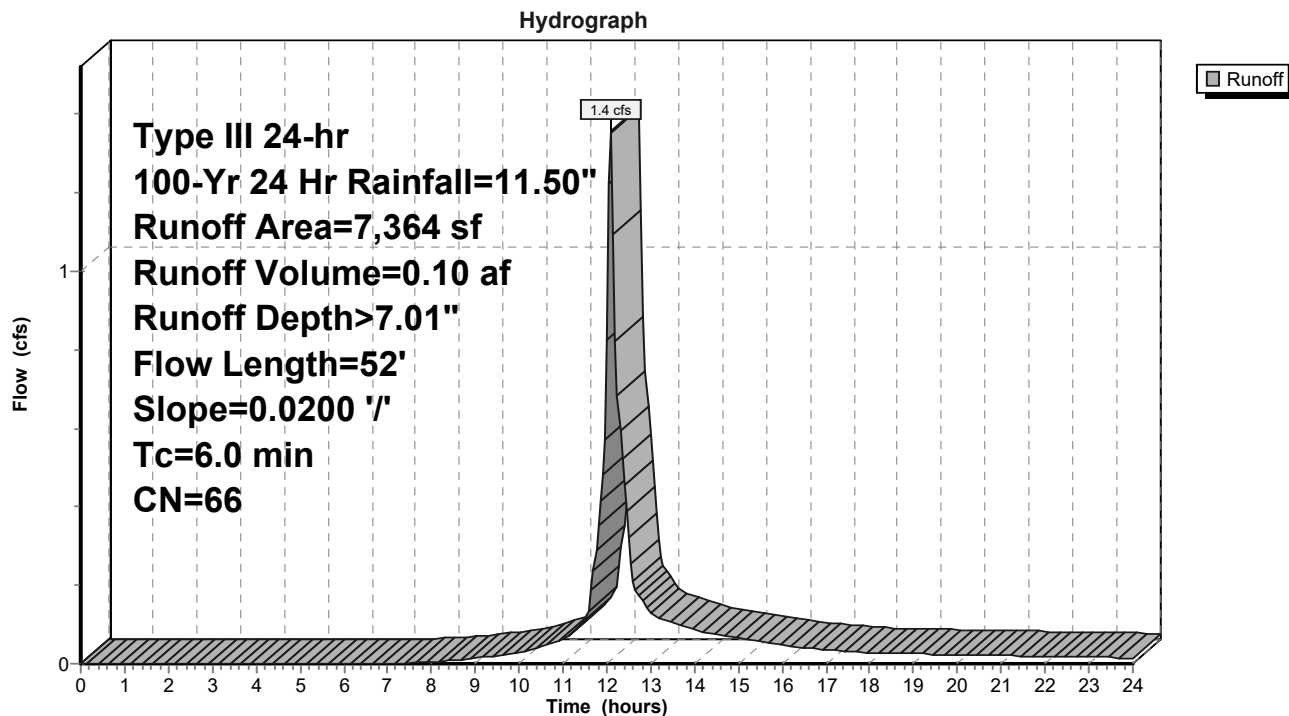
Summary for Subcatchment SC-1: Subcatchment 1

Runoff = 1.4 cfs @ 12.09 hrs, Volume= 0.10 af, Depth> 7.01"
 Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Area (sf)	CN	Description
3,644	39	>75% Grass cover, Good, HSG A
* 1,684	98	Driveway/Walkways
* 1,412	98	Roof
* 218	98	Roof
406	39	>75% Grass cover, Good, HSG A
7,364	66	Weighted Average
4,050		55.00% Pervious Area
3,314		45.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	24	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
0.4	26	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.04"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.8					Direct Entry, Min. Engineering Practice
6.0	52	Total			

Subcatchment SC-1: Subcatchment 1

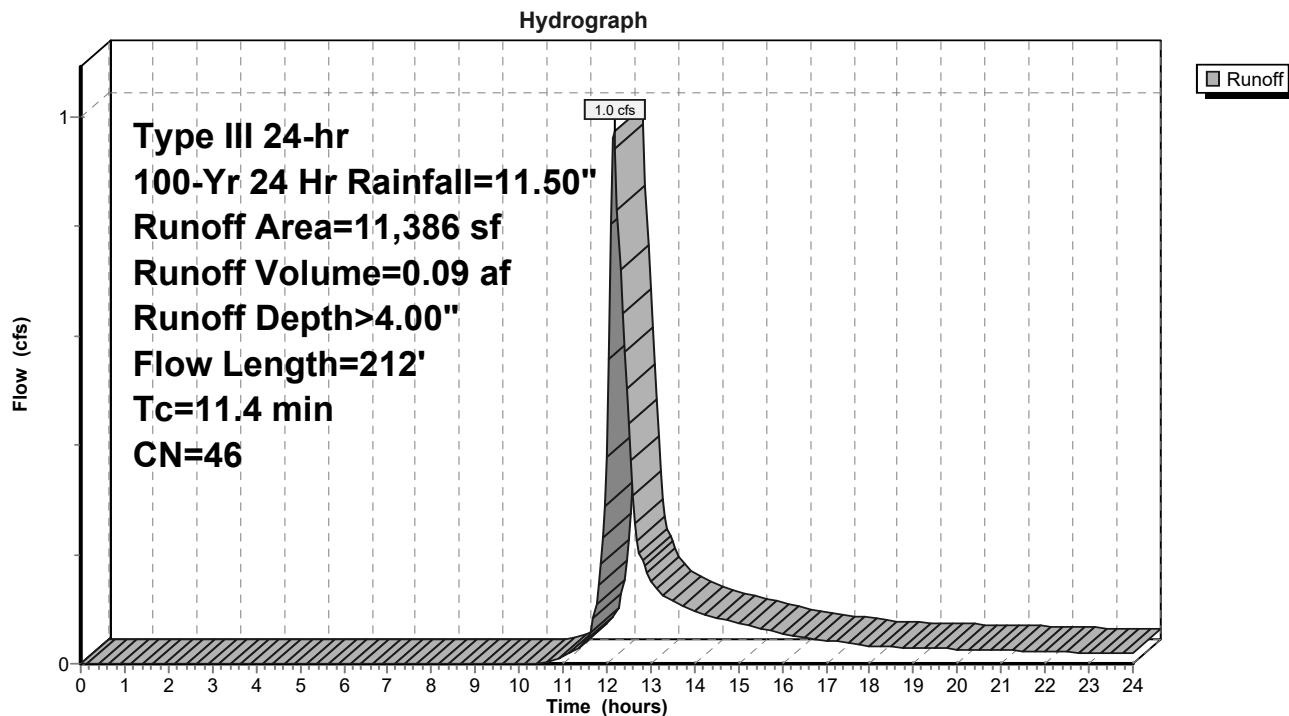
Summary for Subcatchment SC-2: Subcatchment 2

Runoff = 1.0 cfs @ 12.17 hrs, Volume= 0.09 af, Depth> 4.00"
 Routed to Pond EX-D1 : Existing Depression-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Area (sf)	CN	Description
3,752	39	>75% Grass cover, Good, HSG A
23	77	Woods, Good, HSG D
* 811	98	Driveway/Walkways/Patios
* 735	98	Roof
3,208	30	Woods, Good, HSG A
* 23	98	Bulkheads
* 192	98	Shed
46	96	Gravel surface, HSG A
2,596	39	>75% Grass cover, Good, HSG A
11,386	46	Weighted Average
9,625		84.53% Pervious Area
1,761		15.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	21	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
7.1	29	0.0200	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.7	50	0.0600	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.8	76	0.1050	1.6		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	36	0.2000	2.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.4	212	Total			

Subcatchment SC-2: Subcatchment 2

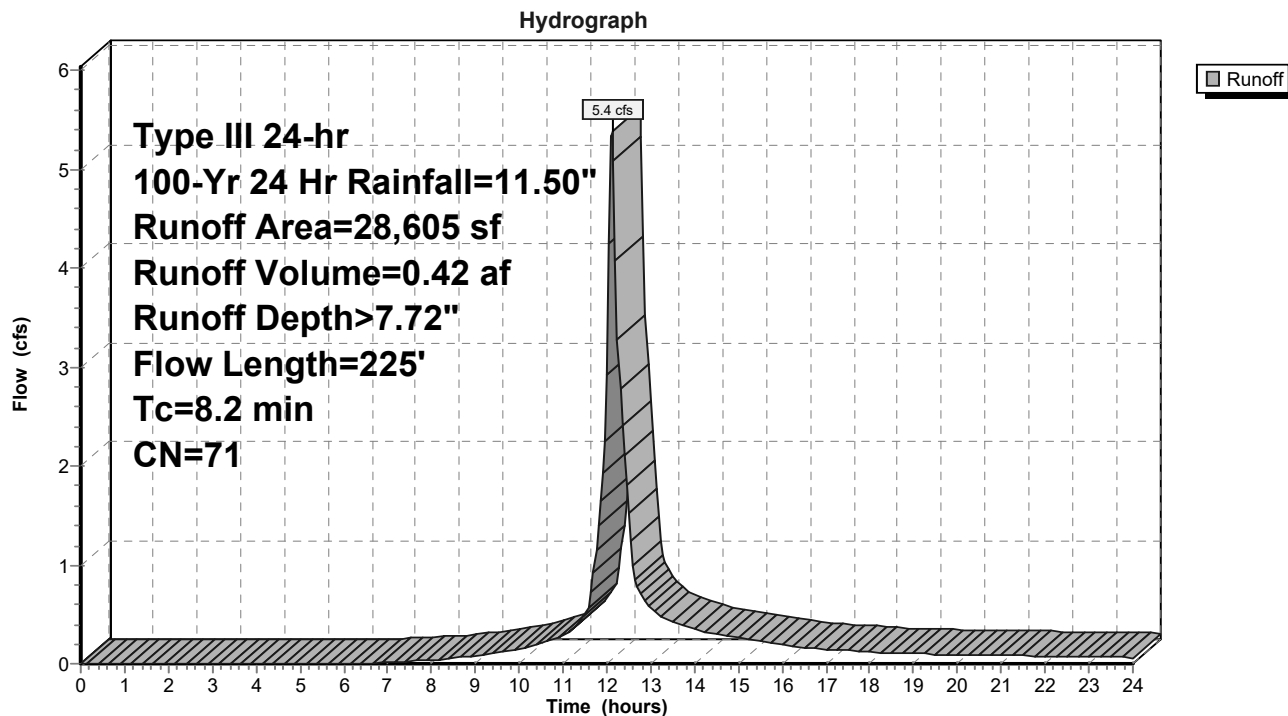
Summary for Subcatchment SC-2.1: Subcatchment 2.1

Runoff = 5.4 cfs @ 12.12 hrs, Volume= 0.42 af, Depth> 7.72"
 Routed to Pond EX-D2 : Existing Depression-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Area (sf)	CN	Description
0	39	>75% Grass cover, Good, HSG A
76	80	>75% Grass cover, Good, HSG D
5,371	77	Woods, Good, HSG D
* 9,310	98	Driveway/Walkways/Patios
* 2,765	98	Roof
4,626	30	Woods, Good, HSG A
* 20	98	Bulkheads
597	96	Gravel surface, HSG A
5,840	39	>75% Grass cover, Good, HSG A
28,605	71	Weighted Average
16,510		57.72% Pervious Area
12,095		42.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	41	0.0200	0.2		Sheet Flow, Grass: Short n= 0.150 P2= 4.04"
1.8	9	0.0560	0.1		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
1.7	119	0.0560	1.2		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	56	0.2210	2.4		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
8.2	225	Total			

Subcatchment SC-2.1: Subcatchment 2.1

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Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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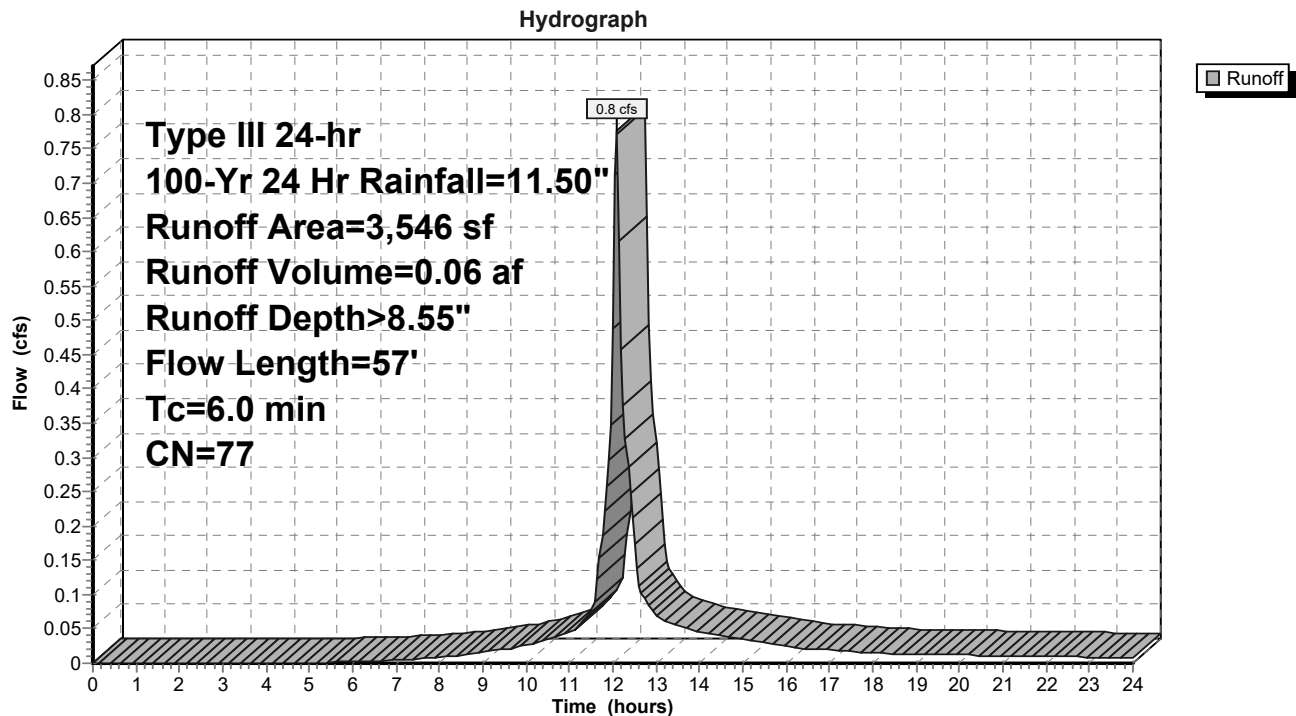
Summary for Subcatchment SC-3: Subcatchment 3

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af, Depth> 8.55"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Area (sf)	CN	Description
3,546	77	Woods, Good, HSG D
3,546		100.00% Pervious Area

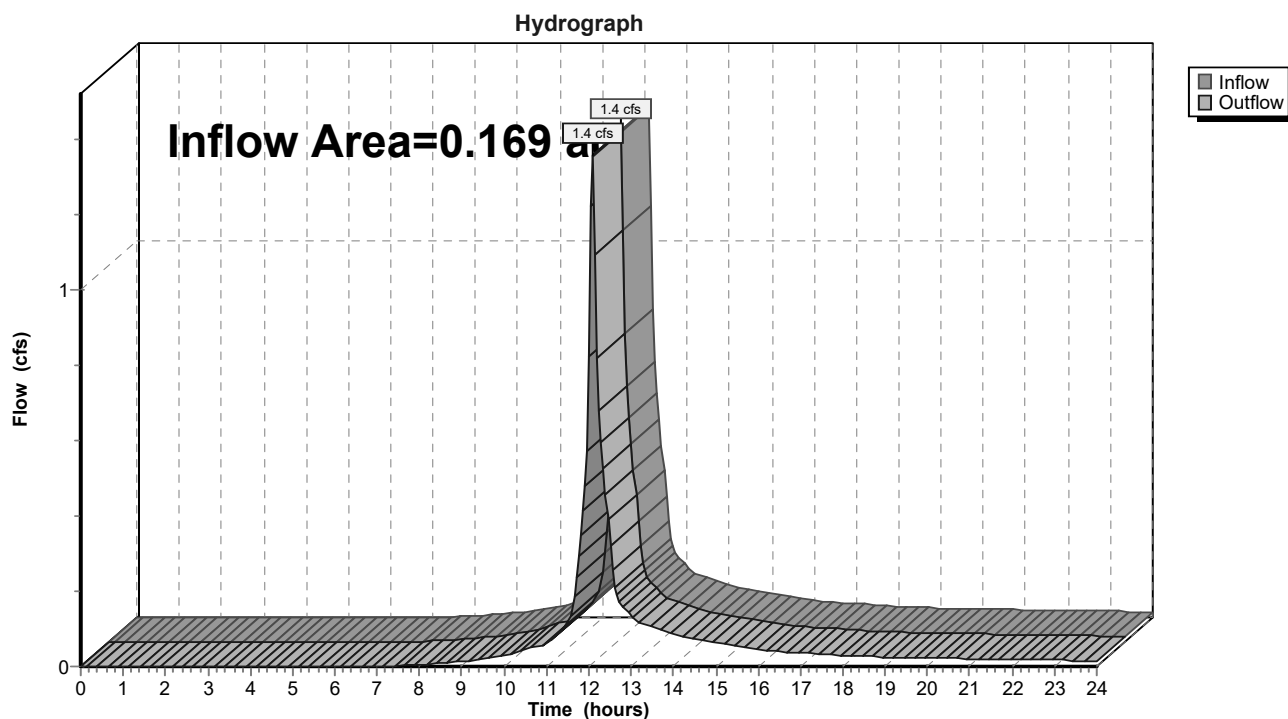
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.1170	0.2		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 4.04"
0.2	7	0.0200	0.7		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.6	57	Total, Increased to minimum Tc = 6.0 min			

Subcatchment SC-3: Subcatchment 3

Summary for Reach DP-1: Design Point 1

Inflow Area = 0.169 ac, 45.00% Impervious, Inflow Depth > 7.01" for 100-Yr 24 Hr event
Inflow = 1.4 cfs @ 12.09 hrs, Volume= 0.10 af
Outflow = 1.4 cfs @ 12.09 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min

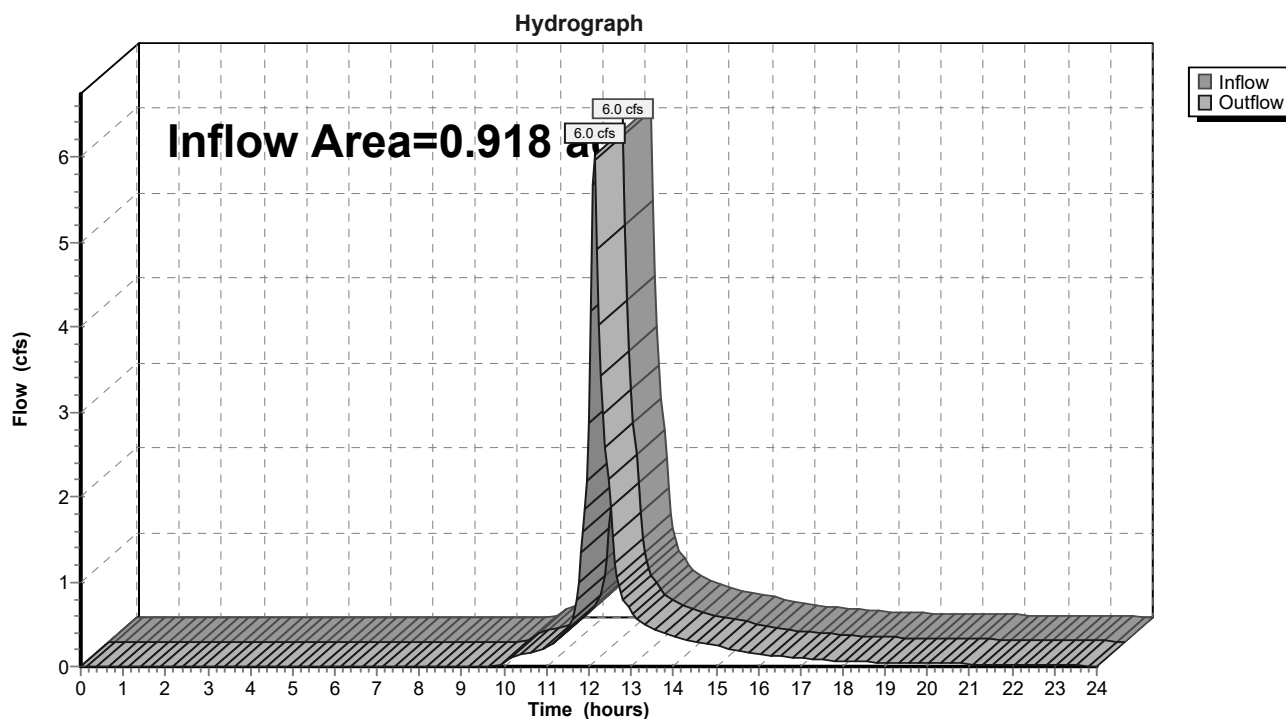
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Design Point 1

Summary for Reach DP-2: Design Point 2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth > 5.03" for 100-Yr 24 Hr event
Inflow = 6.0 cfs @ 12.14 hrs, Volume= 0.38 af
Outflow = 6.0 cfs @ 12.14 hrs, Volume= 0.38 af, Atten= 0%, Lag= 0.0 min

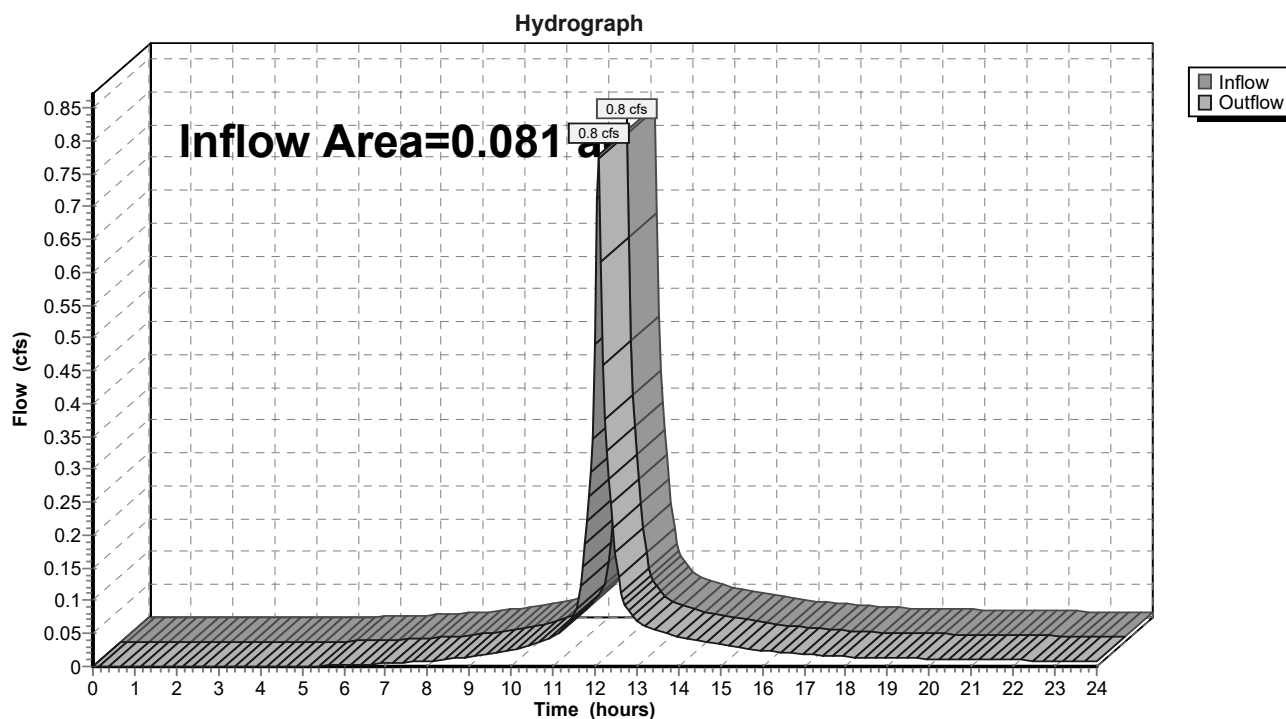
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-2: Design Point 2

Summary for Reach DP-3: Design Point 3

Inflow Area = 0.081 ac, 0.00% Impervious, Inflow Depth > 8.55" for 100-Yr 24 Hr event
Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af
Outflow = 0.8 cfs @ 12.09 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-3: Design Point 3

Summary for Pond EX-D1: Existing Depression-1

Inflow Area = 0.261 ac, 15.47% Impervious, Inflow Depth > 4.00" for 100-Yr 24 Hr event
 Inflow = 1.0 cfs @ 12.17 hrs, Volume= 0.09 af
 Outflow = 1.0 cfs @ 12.17 hrs, Volume= 0.08 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.0 cfs @ 12.17 hrs, Volume= 0.04 af
 Primary = 1.0 cfs @ 12.17 hrs, Volume= 0.04 af
 Routed to Pond EX-D2 : Existing Depression-2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.18' @ 12.17 hrs Surf.Area= 888 sf Storage= 450 cf

Plug-Flow detention time= 63.9 min calculated for 0.08 af (95% of inflow)
 Center-of-Mass det. time= 37.8 min (898.9 - 861.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	78.80'	819 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
78.80	32	25.0	0	0	32
79.00	64	46.0	9	9	151
80.00	648	104.0	305	315	847
80.50	1,421	148.0	505	819	1,732

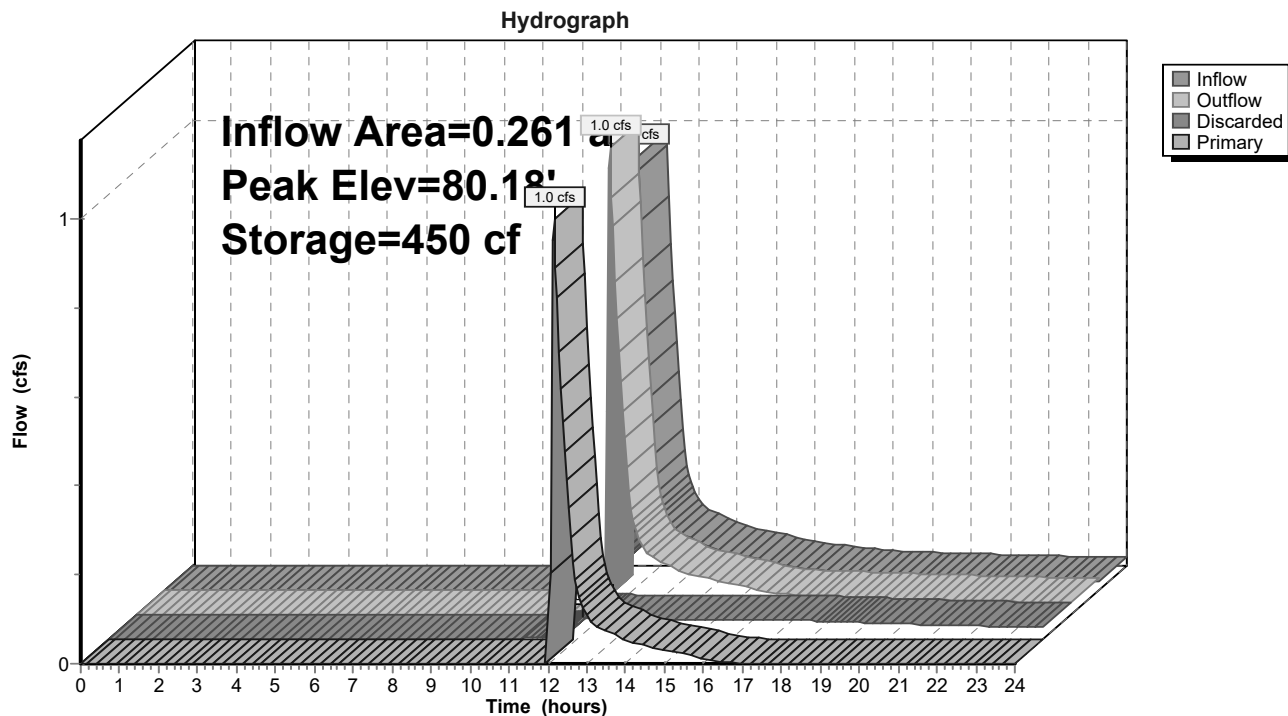
Device	Routing	Invert	Outlet Devices											
#1	Primary	80.10'	20.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00											
			2.50 3.00 3.50 4.00 4.50 5.00 5.50											
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65											
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88											
#2	Discarded	78.80'	2.410 in/hr Exfiltration over Surface area											

Discarded OutFlow Max=0.0 cfs @ 12.17 hrs HW=80.17' (Free Discharge)

↑ **2=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.9 cfs @ 12.17 hrs HW=80.17' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.9 cfs @ 0.6 fps)

Pond EX-D1: Existing Depression-1

Summary for Pond EX-D2: Existing Depression-2

Inflow Area = 0.918 ac, 34.65% Impervious, Inflow Depth > 6.09" for 100-Yr 24 Hr event
 Inflow = 6.1 cfs @ 12.14 hrs, Volume= 0.47 af
 Outflow = 6.1 cfs @ 12.14 hrs, Volume= 0.46 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.1 cfs @ 11.80 hrs, Volume= 0.07 af
 Primary = 6.0 cfs @ 12.14 hrs, Volume= 0.38 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 76.80' @ 12.14 hrs Surf.Area= 1,120 sf Storage= 519 cf

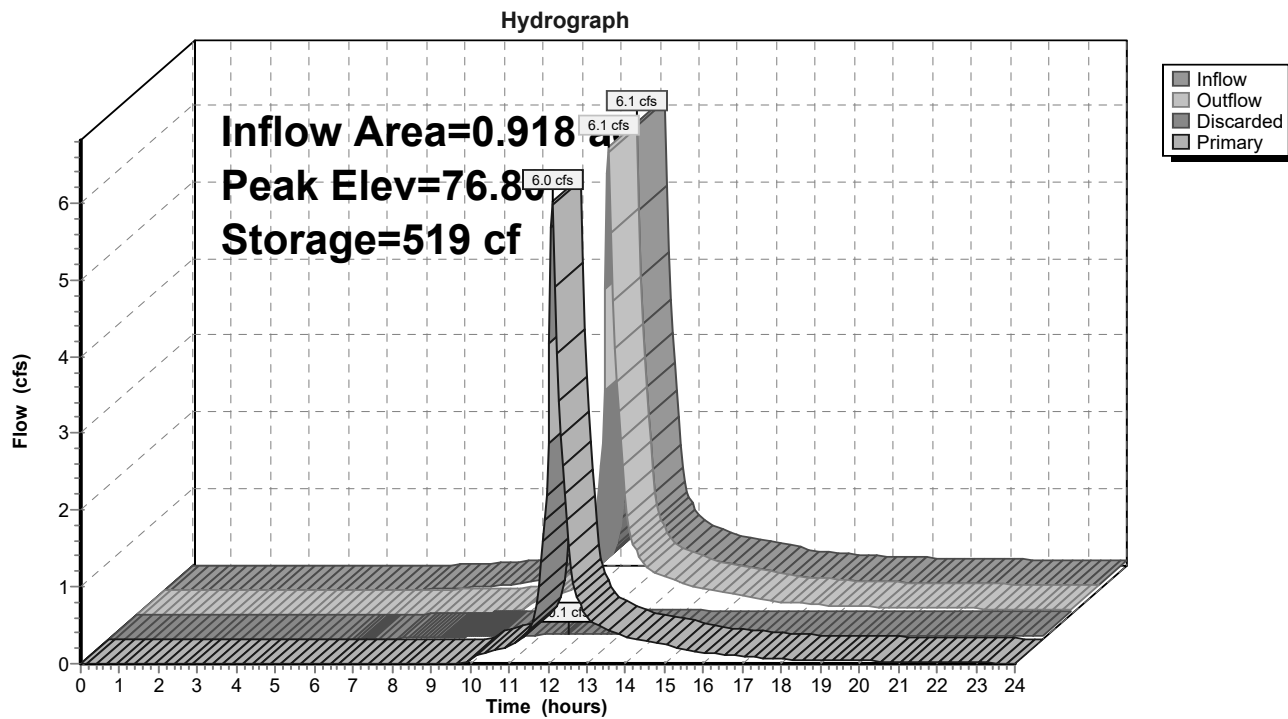
Plug-Flow detention time= 18.9 min calculated for 0.46 af (98% of inflow)
 Center-of-Mass det. time= 6.7 min (812.3 - 805.6)

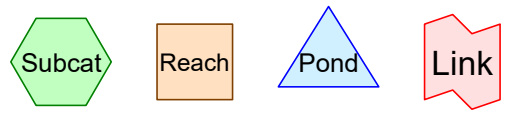
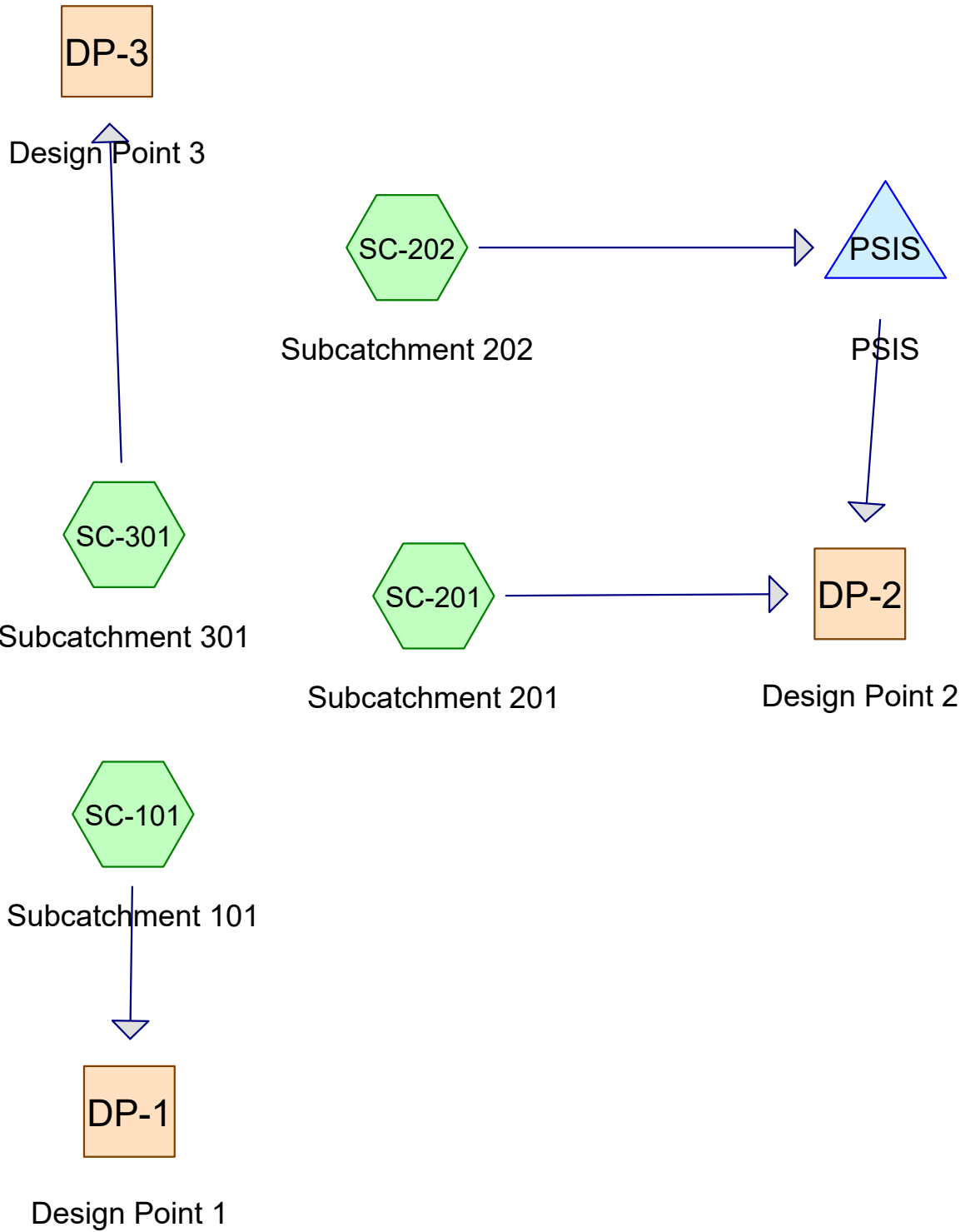
Volume	Invert	Avail.Storage	Storage Description		
#1	75.60'	519 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.60	172	80.0	0	0	172
76.00	345	115.0	101	101	717
76.60	1,120	212.0	417	519	3,243

Device	Routing	Invert	Outlet Devices
#1	Primary	76.50'	15.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	75.60'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.1 cfs @ 11.80 hrs HW=76.61' (Free Discharge)
 ↑ **2=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=5.9 cfs @ 12.14 hrs HW=76.80' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 5.9 cfs @ 1.3 fps)

Pond EX-D2: Existing Depression-2



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.226	39	>75% Grass cover, Good, HSG A (SC-101, SC-201, SC-202)
0.262	80	>75% Grass cover, Good, HSG D (SC-201, SC-202, SC-301)
0.017	98	Existing Roof (SC-101, SC-201)
0.016	98	Proposed Bit. Conc. Walkway (SC-202)
0.051	98	Proposed Driveway (SC-101)
0.560	98	Proposed Roof Area (SC-202)
0.035	96	Proposed Stone Dust Walkway (SC-201, SC-202)
1.169	82	TOTAL AREA

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Proposed Conditions

Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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Summary for Subcatchment SC-101: Subcatchment 101

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 0.013 af, Depth> 1.62"
 Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

Area (sf)	CN	Description
1,288	39	>75% Grass cover, Good, HSG A
* 2,243	98	Proposed Driveway
* 218	98	Existing Roof
406	39	>75% Grass cover, Good, HSG A
4,155	74	Weighted Average
1,694		40.77% Pervious Area
2,461		59.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	25	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
0.4	25	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.01"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7					Direct Entry, Min. Engineering Practice
6.0	52	Total			

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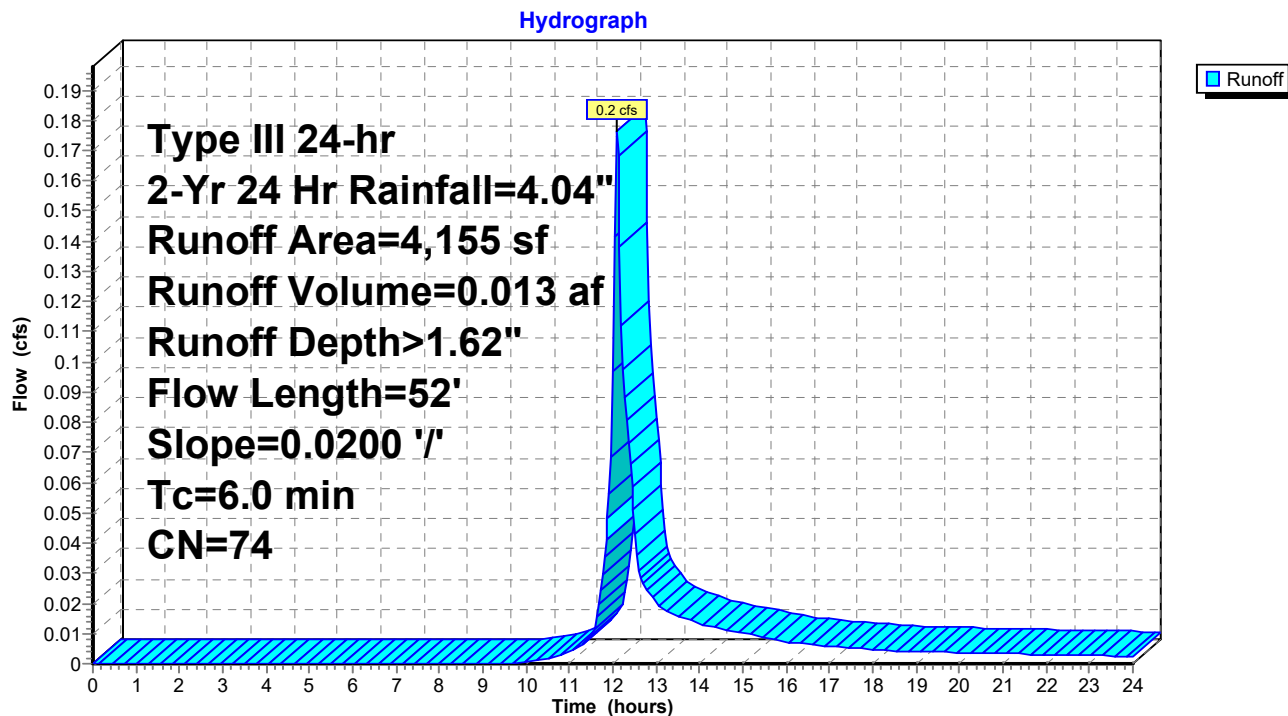
Proposed Conditions

Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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Subcatchment SC-101: Subcatchment 101



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Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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Summary for Subcatchment SC-201: Subcatchment 201

Runoff = 0.3 cfs @ 12.14 hrs, Volume= 0.027 af, Depth> 1.17"
 Routed to Reach DP-2 : Design Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

Area (sf)	CN	Description
4,295	39	>75% Grass cover, Good, HSG A
* 791	96	Proposed Stone Dust Walkway
6,455	80	>75% Grass cover, Good, HSG D
* 218	98	Existing Roof
* 322	98	Existing Roof
12,081	67	Weighted Average
11,541		95.53% Pervious Area
540		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0570	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
4.8	89	0.0700	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
1.0	26	0.3300	0.4		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
9.1	165	Total			

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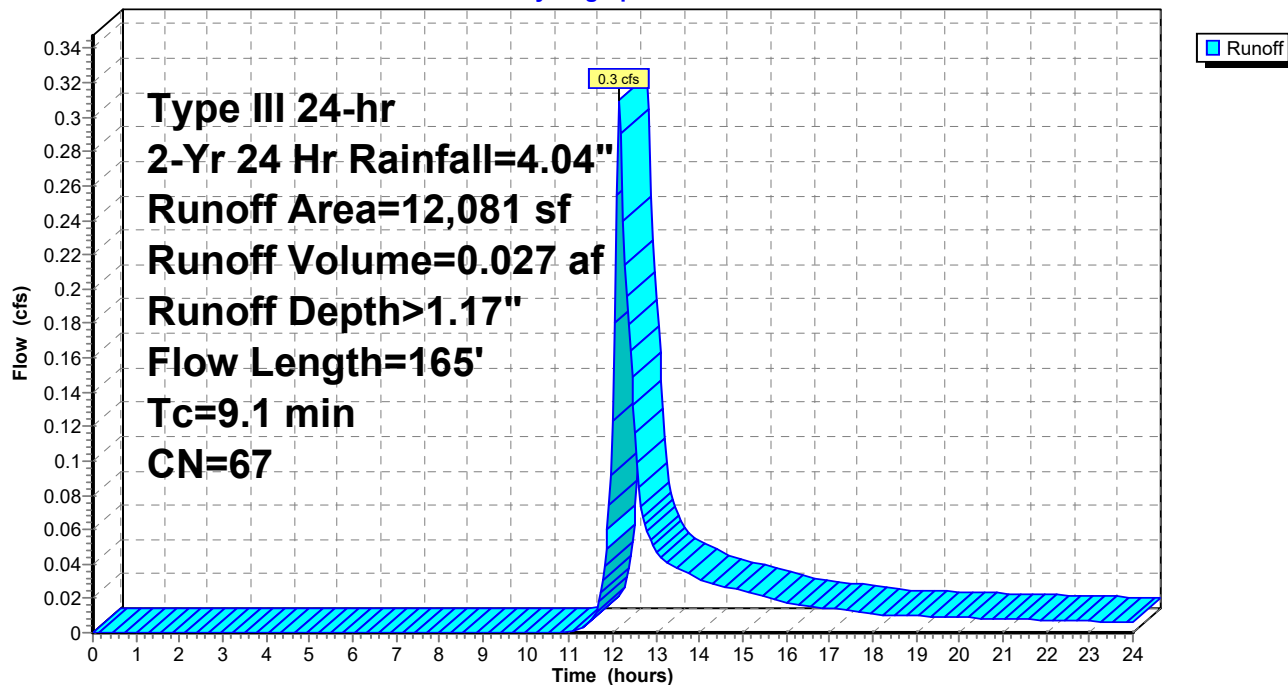
Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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Subcatchment SC-201: Subcatchment 201

Hydrograph



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Proposed Conditions

Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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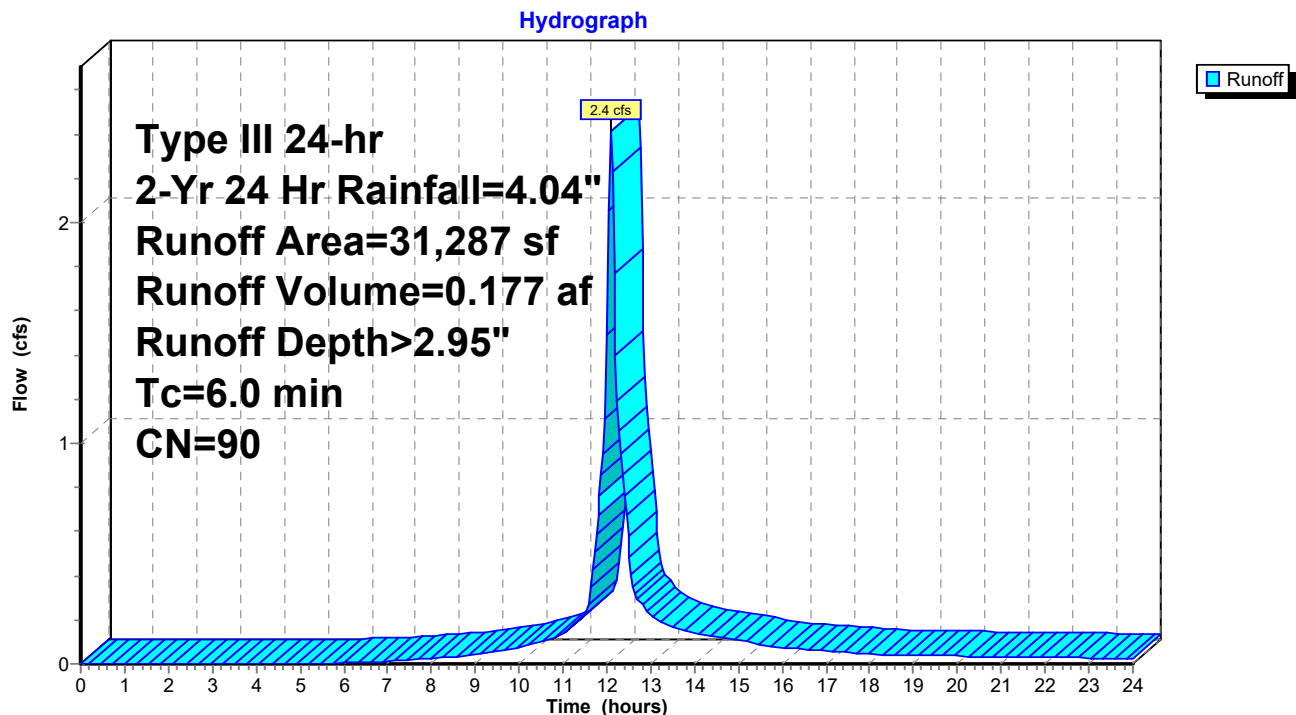
Summary for Subcatchment SC-202: Subcatchment 202

Runoff = 2.4 cfs @ 12.09 hrs, Volume= 0.177 af, Depth> 2.95"
Routed to Pond PSIS : PSIS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

	Area (sf)	CN	Description
*	24,400	98	Proposed Roof Area
	3,872	39	>75% Grass cover, Good, HSG A
	1,583	80	>75% Grass cover, Good, HSG D
*	720	96	Proposed Stone Dust Walkway
*	712	98	Proposed Bit. Conc. Walkway
	31,287	90	Weighted Average
	6,175		19.74% Pervious Area
	25,112		80.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. Engineering Standard

Subcatchment SC-202: Subcatchment 202

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Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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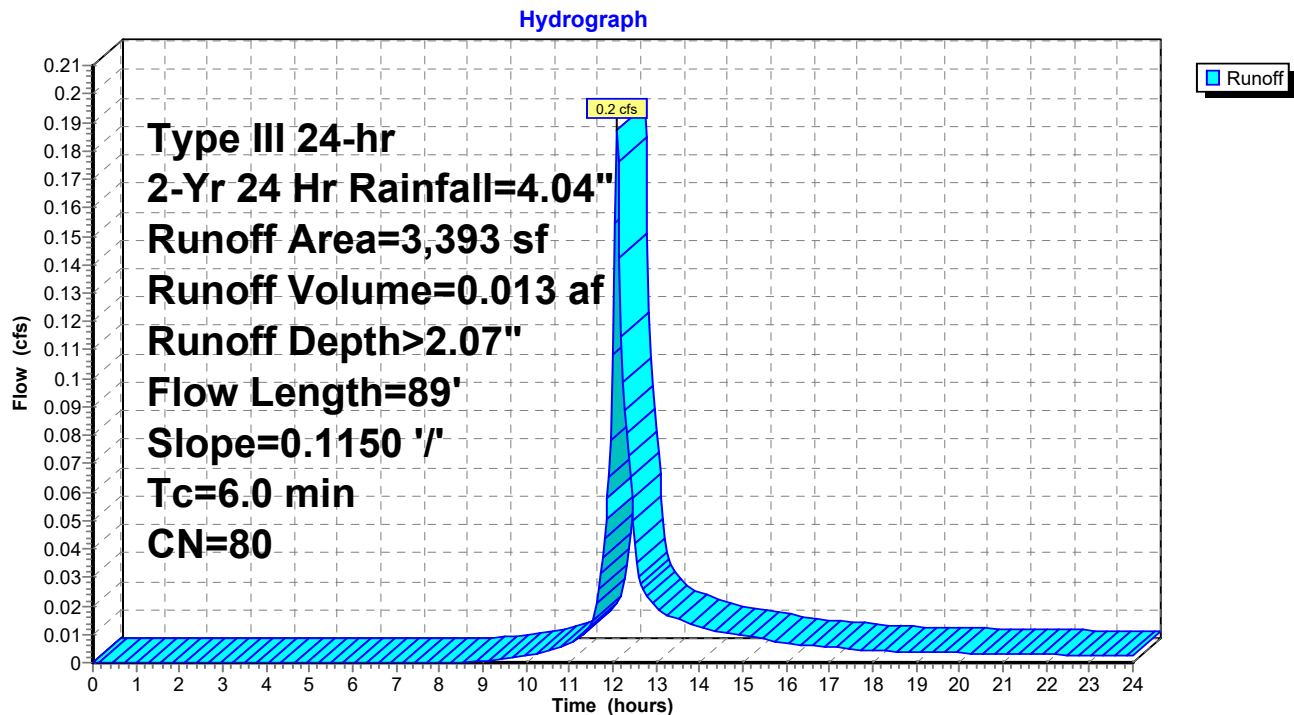
Summary for Subcatchment SC-301: Subcatchment 301

Runoff = 0.2 cfs @ 12.09 hrs, Volume= 0.013 af, Depth> 2.07"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

Area (sf)	CN	Description
3,393	80	>75% Grass cover, Good, HSG D
3,393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.1150	0.2		Sheet Flow,
					Grass: Dense n= 0.240 P2= 4.01"
0.4	39	0.1150	1.7		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
2.0					Direct Entry, Min. Engineering Practice
6.0	89	Total			

Subcatchment SC-301: Subcatchment 301

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Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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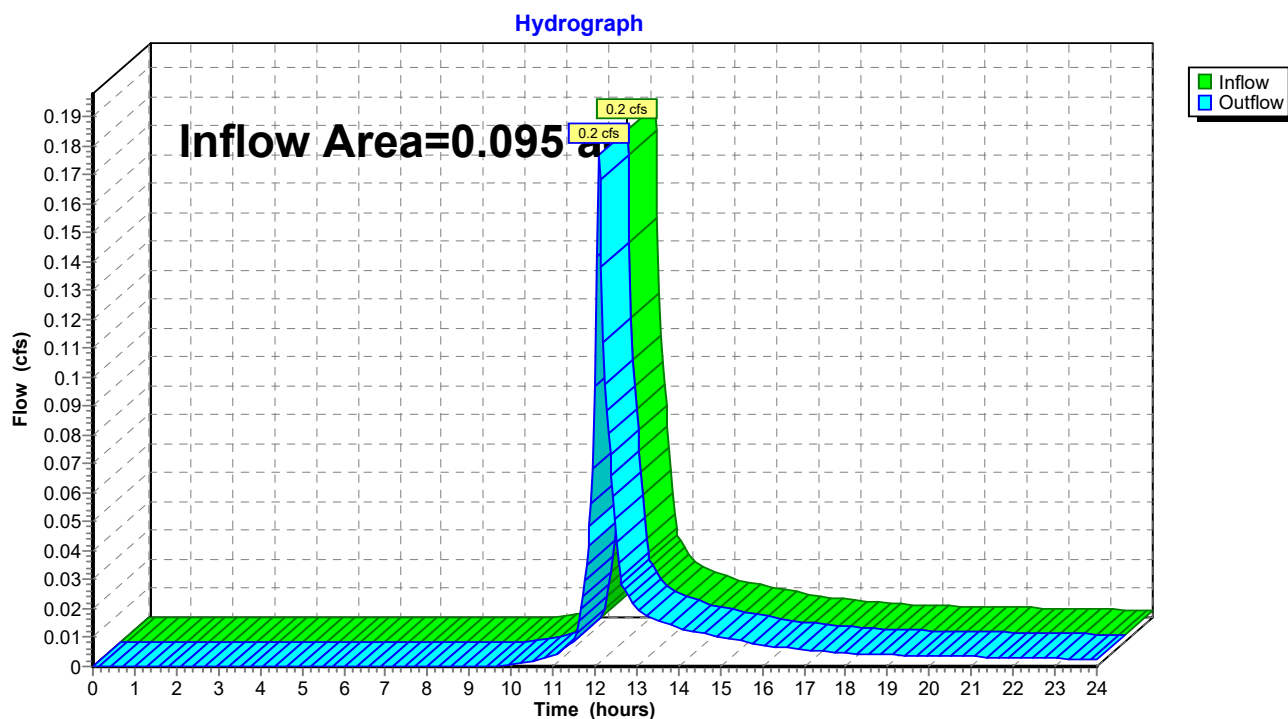
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Summary for Reach DP-1: Design Point 1

Inflow Area = 0.095 ac, 59.23% Impervious, Inflow Depth > 1.62" for 2-Yr 24 Hr event
Inflow = 0.2 cfs @ 12.09 hrs, Volume= 0.013 af
Outflow = 0.2 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-1: Design Point 1



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Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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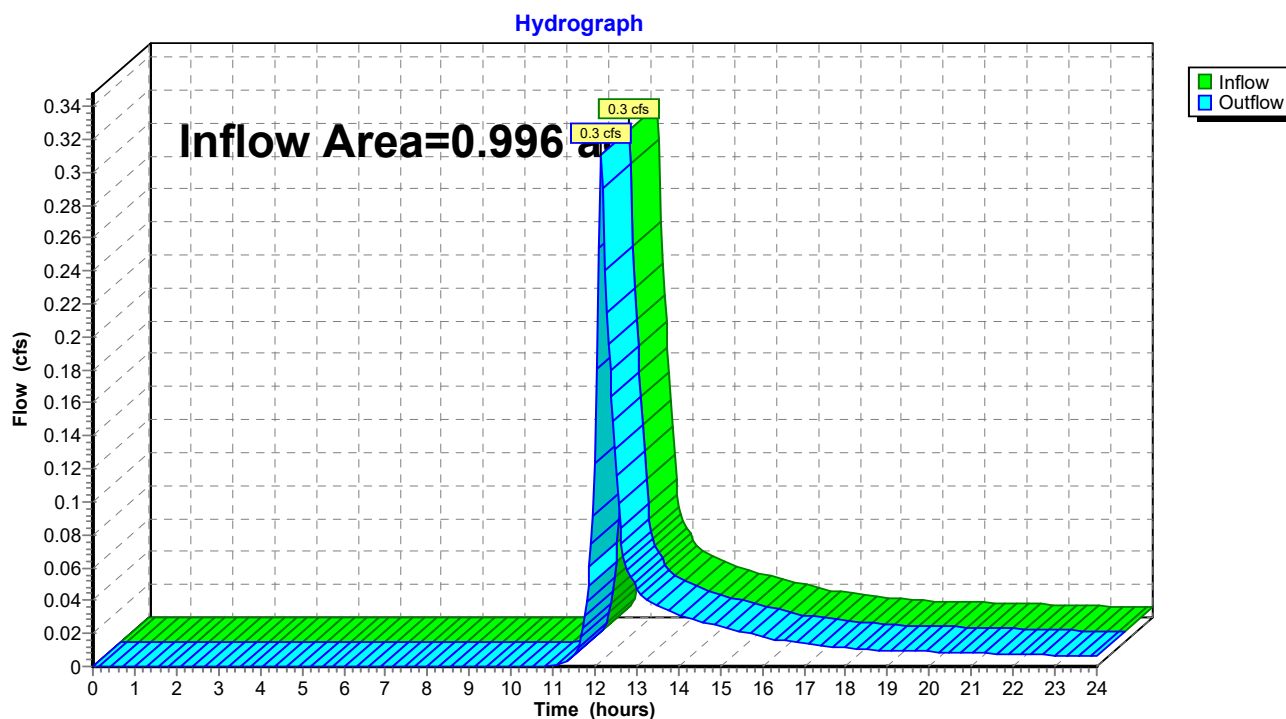
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Summary for Reach DP-2: Design Point 2

Inflow Area = 0.996 ac, 59.15% Impervious, Inflow Depth > 0.33" for 2-Yr 24 Hr event
Inflow = 0.3 cfs @ 12.14 hrs, Volume= 0.027 af
Outflow = 0.3 cfs @ 12.14 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-2: Design Point 2



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Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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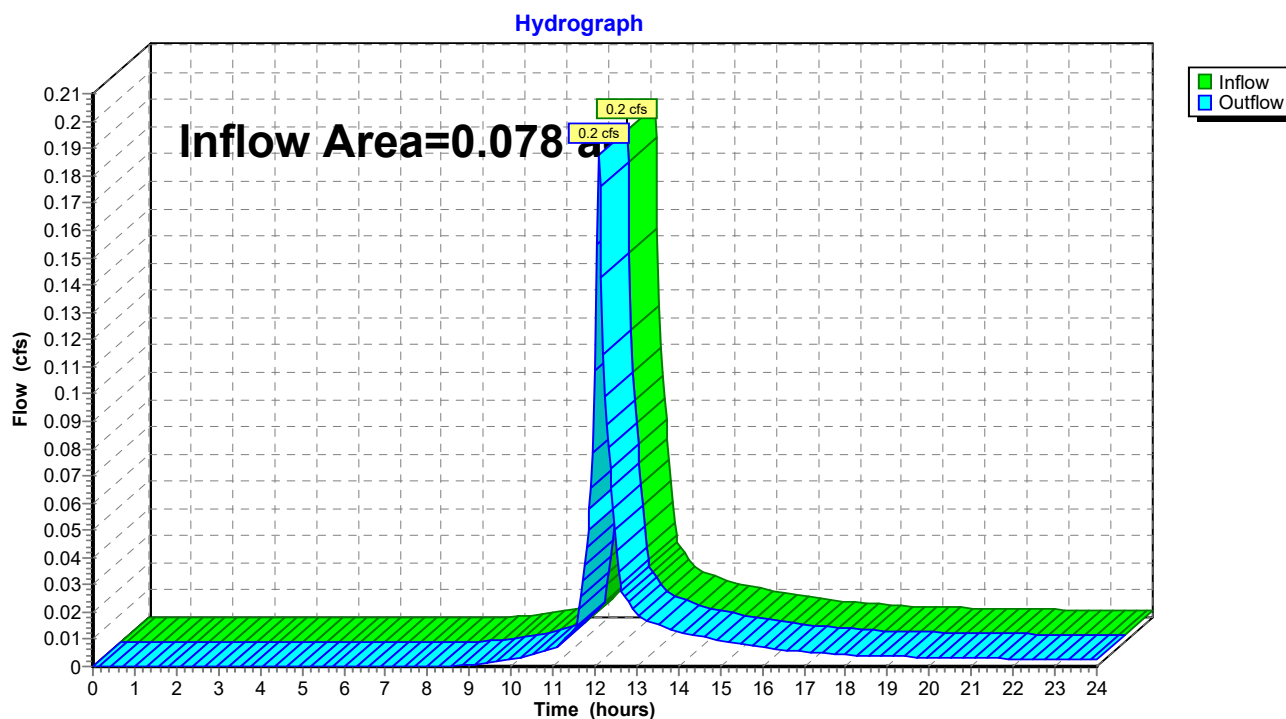
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Summary for Reach DP-3: Design Point 3

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth > 2.07" for 2-Yr 24 Hr event
Inflow = 0.2 cfs @ 12.09 hrs, Volume= 0.013 af
Outflow = 0.2 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-3: Design Point 3



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Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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Summary for Pond PSIS: PSIS

Inflow Area = 0.718 ac, 80.26% Impervious, Inflow Depth > 2.95" for 2-Yr 24 Hr event
 Inflow = 2.4 cfs @ 12.09 hrs, Volume= 0.177 af
 Outflow = 0.2 cfs @ 11.36 hrs, Volume= 0.177 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.2 cfs @ 11.36 hrs, Volume= 0.177 af
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 83.25' @ 13.59 hrs Surf.Area= 2,958 sf Storage= 3,312 cf

Plug-Flow detention time= 175.3 min calculated for 0.176 af (100% of inflow)
 Center-of-Mass det. time= 174.0 min (971.7 - 797.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	81.50'	5,019 cf	83.00'W x 35.64'L x 6.75'H Field A 19,968 cf Overall - 7,420 cf Embedded = 12,548 cf x 40.0% Voids
#2A	82.25'	7,420 cf	ADS_StormTech MC-4500 b +Cap x 63 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 63 Chambers in 9 Rows Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf
		12,439 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	81.50'	2.410 in/hr Exfiltration over Surface area
#2	Device 3	86.67'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	86.67'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.67' / 86.50' S= 0.0340 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.2 cfs @ 11.36 hrs HW=81.57' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=81.50' (Free Discharge)
 ↑ **3=Culvert** (Controls 0.0 cfs)
 ↑ **2=Orifice/Grate** (Controls 0.0 cfs)

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Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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Pond PSIS: PSIS - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

7 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 33.64' Row Length +12.0" End Stone x 2 = 35.64' Base Length

9 Rows x 100.0" Wide + 9.0" Spacing x 8 + 12.0" Side Stone x 2 = 83.00' Base Width

9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

63 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 9 Rows = 7,419.9 cf Chamber Storage

19,968.2 cf Field - 7,419.9 cf Chambers = 12,548.3 cf Stone x 40.0% Voids = 5,019.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,439.2 cf = 0.286 af

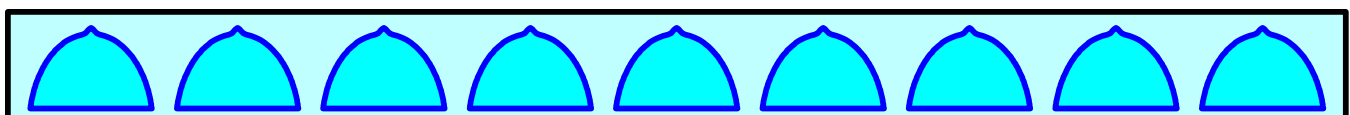
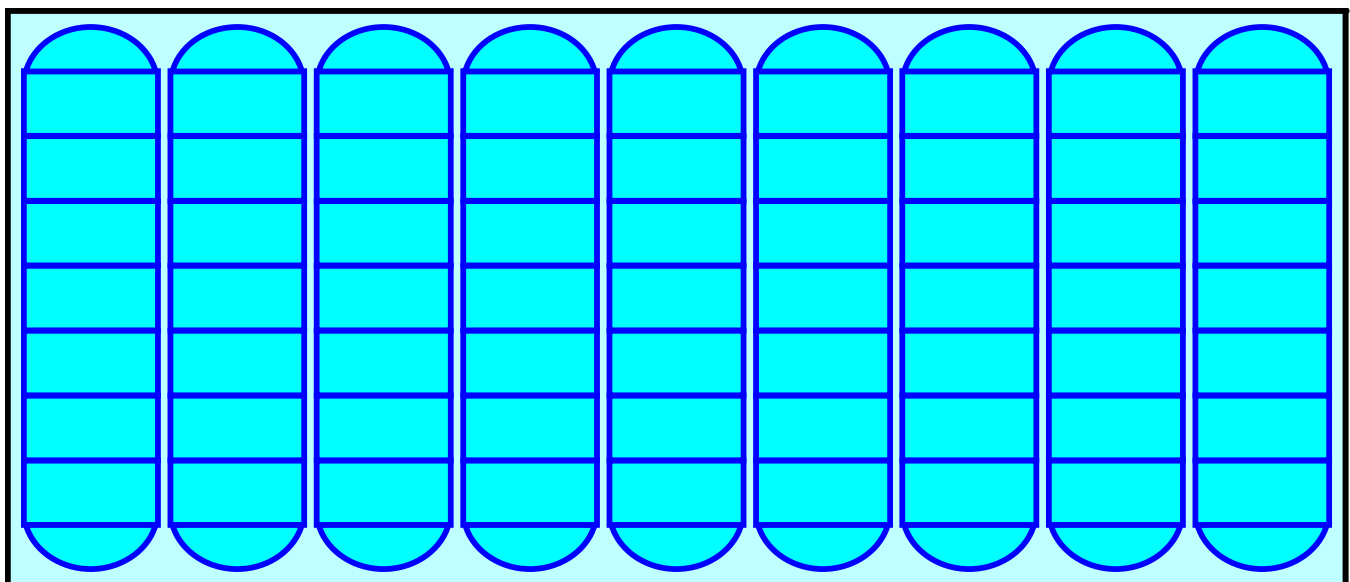
Overall Storage Efficiency = 62.3%

Overall System Size = 35.64' x 83.00' x 6.75'

63 Chambers

739.6 cy Field

464.8 cy Stone



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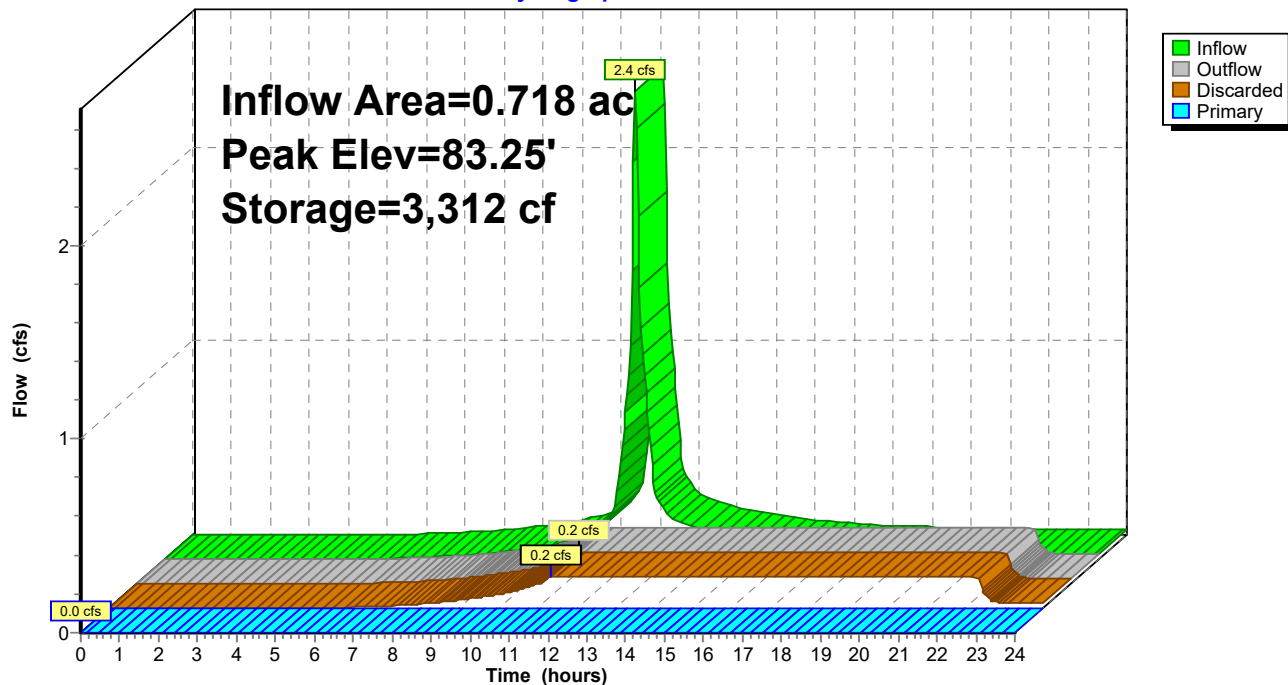
Type III 24-hr 2-Yr 24 Hr Rainfall=4.04"

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Pond PSIS: PSIS

Hydrograph



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Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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Summary for Subcatchment SC-101: Subcatchment 101

Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.028 af, Depth> 3.55"
 Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

Area (sf)	CN	Description
1,288	39	>75% Grass cover, Good, HSG A
* 2,243	98	Proposed Driveway
* 218	98	Existing Roof
406	39	>75% Grass cover, Good, HSG A
4,155	74	Weighted Average
1,694		40.77% Pervious Area
2,461		59.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	25	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
0.4	25	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.01"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7					Direct Entry, Min. Engineering Practice
6.0	52	Total			

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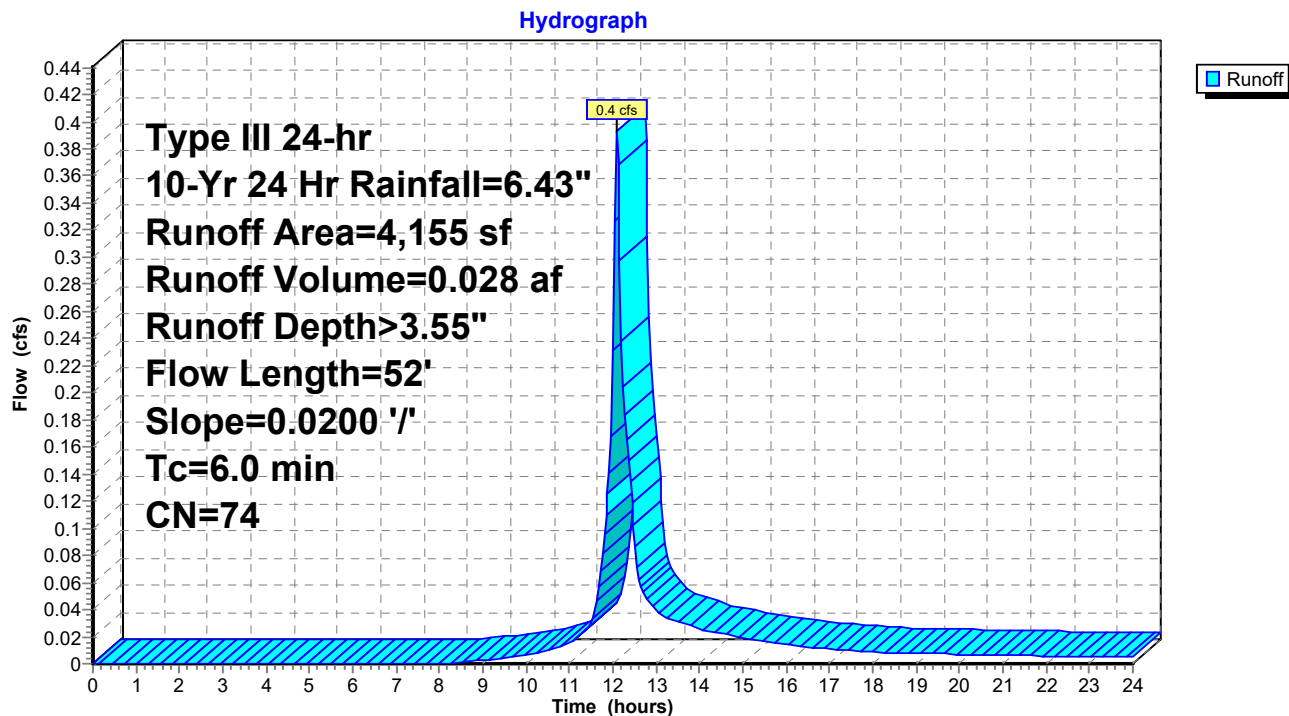
Proposed Conditions

Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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Subcatchment SC-101: Subcatchment 101



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Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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Summary for Subcatchment SC-201: Subcatchment 201

Runoff = 0.8 cfs @ 12.13 hrs, Volume= 0.066 af, Depth> 2.85"
 Routed to Reach DP-2 : Design Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

Area (sf)	CN	Description
4,295	39	>75% Grass cover, Good, HSG A
* 791	96	Proposed Stone Dust Walkway
6,455	80	>75% Grass cover, Good, HSG D
* 218	98	Existing Roof
* 322	98	Existing Roof
12,081	67	Weighted Average
11,541		95.53% Pervious Area
540		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0570	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
4.8	89	0.0700	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
1.0	26	0.3300	0.4		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
9.1	165	Total			

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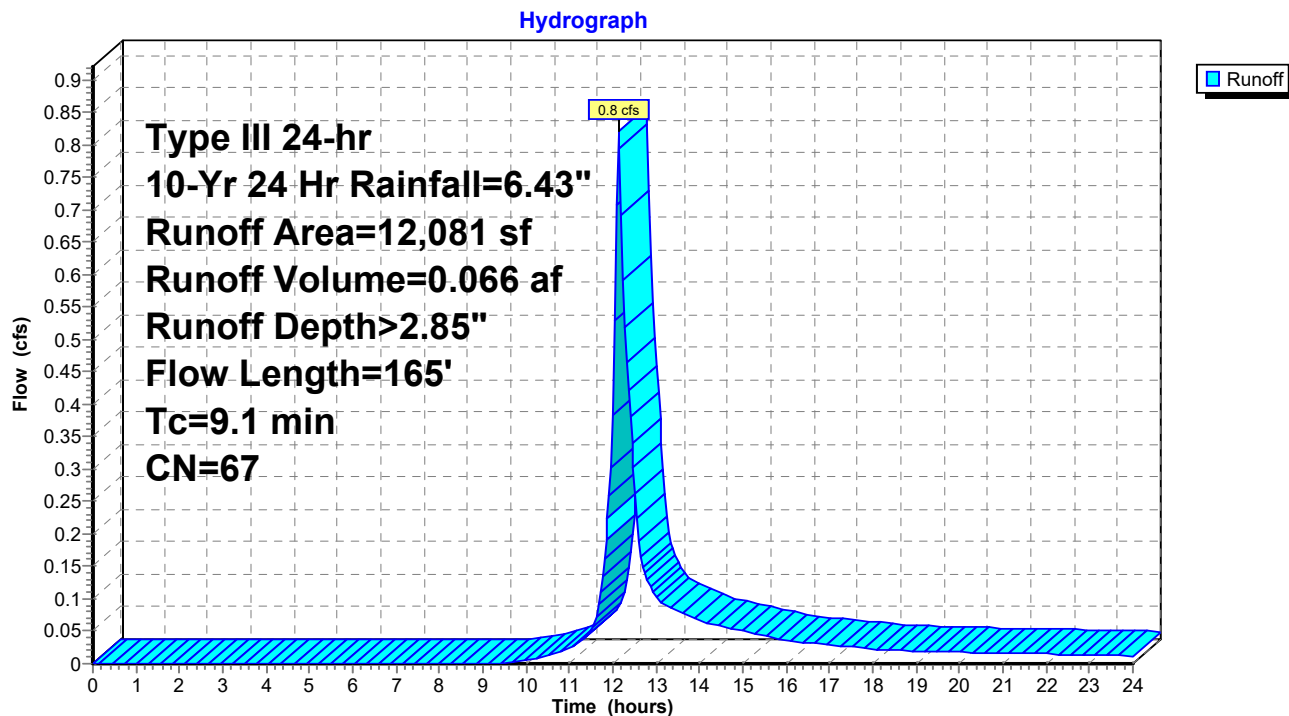
Proposed Conditions

Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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Subcatchment SC-201: Subcatchment 201



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Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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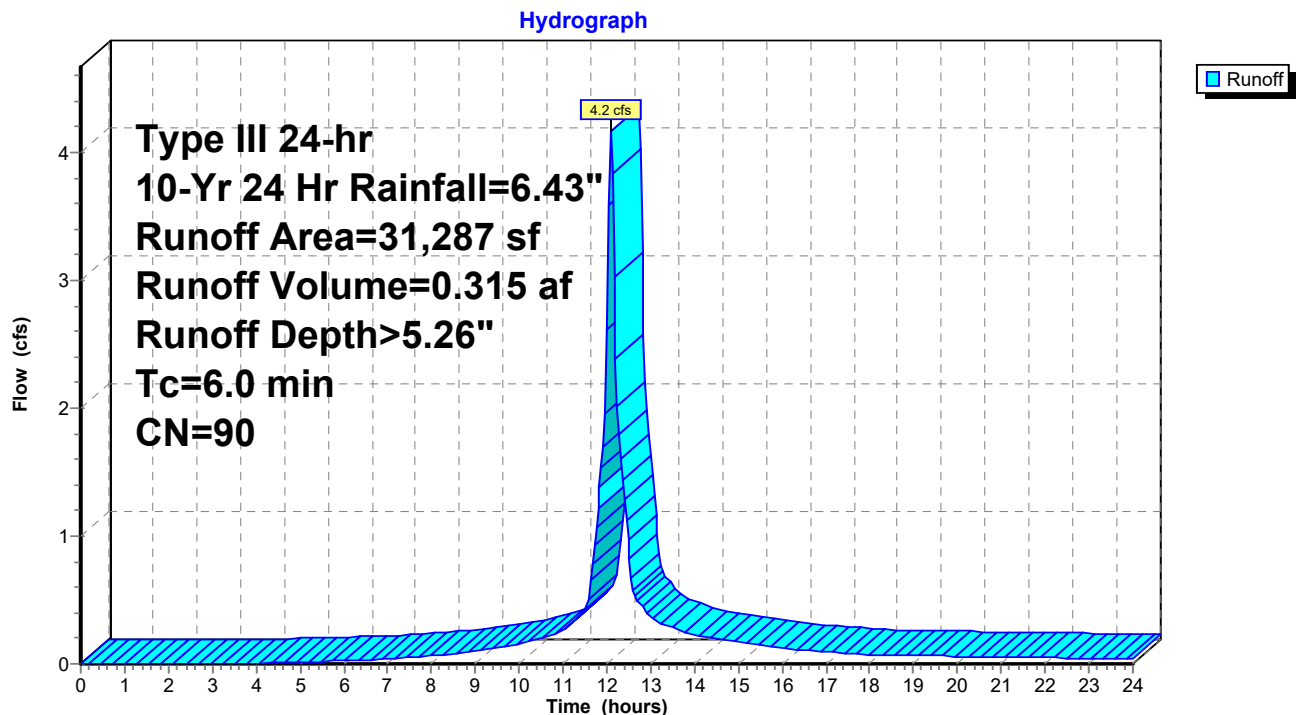
Summary for Subcatchment SC-202: Subcatchment 202

Runoff = 4.2 cfs @ 12.09 hrs, Volume= 0.315 af, Depth> 5.26"
Routed to Pond PSIS : PSIS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

	Area (sf)	CN	Description
*	24,400	98	Proposed Roof Area
	3,872	39	>75% Grass cover, Good, HSG A
	1,583	80	>75% Grass cover, Good, HSG D
*	720	96	Proposed Stone Dust Walkway
*	712	98	Proposed Bit. Conc. Walkway
	31,287	90	Weighted Average
	6,175		19.74% Pervious Area
	25,112		80.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. Engineering Standard

Subcatchment SC-202: Subcatchment 202

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Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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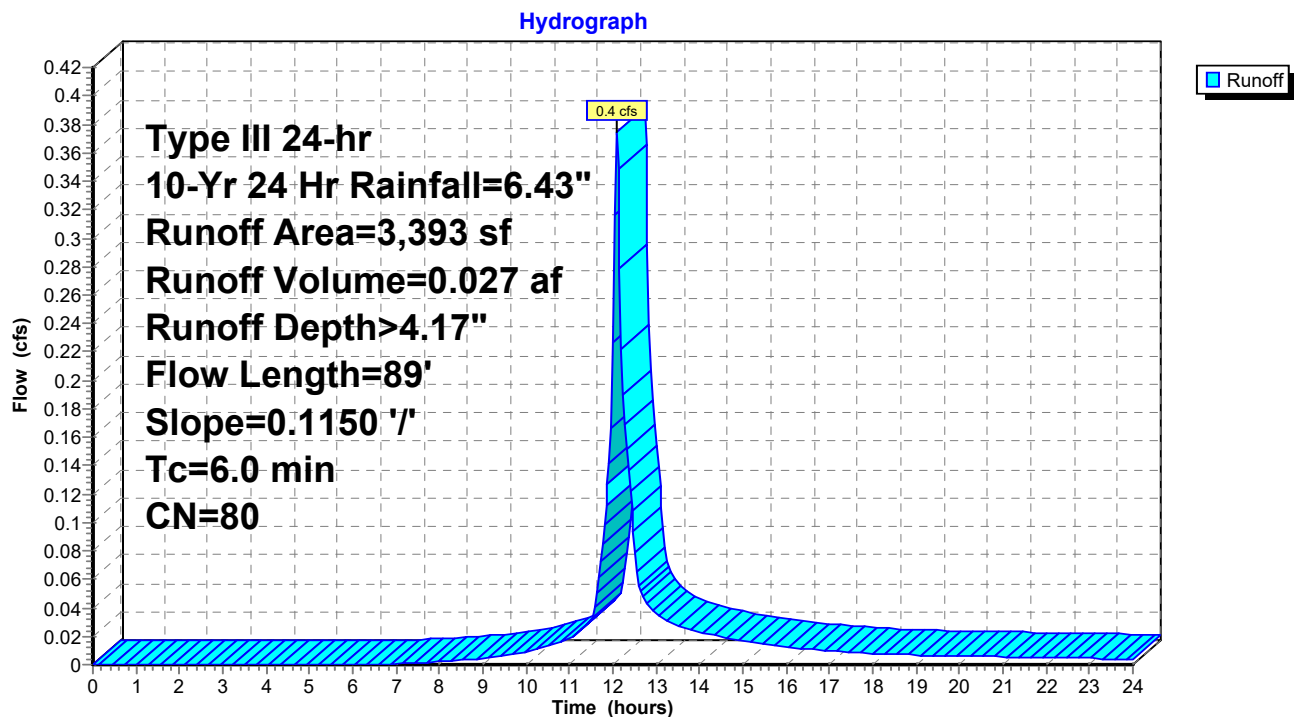
Summary for Subcatchment SC-301: Subcatchment 301

Runoff = 0.4 cfs @ 12.09 hrs, Volume= 0.027 af, Depth> 4.17"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

Area (sf)	CN	Description
3,393	80	>75% Grass cover, Good, HSG D
3,393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.1150	0.2		Sheet Flow,
					Grass: Dense n= 0.240 P2= 4.01"
0.4	39	0.1150	1.7		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
2.0					Direct Entry, Min. Engineering Practice
6.0	89	Total			

Subcatchment SC-301: Subcatchment 301

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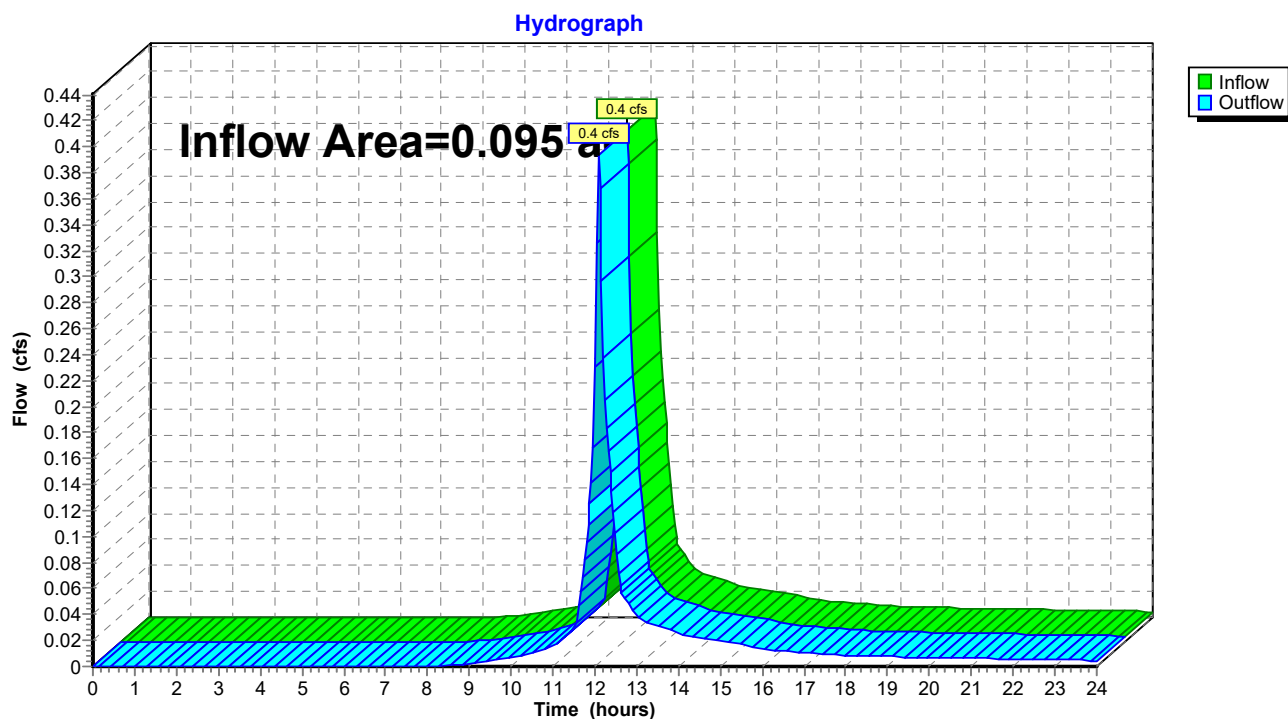
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Summary for Reach DP-1: Design Point 1

Inflow Area = 0.095 ac, 59.23% Impervious, Inflow Depth > 3.55" for 10-Yr 24 Hr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.028 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-1: Design Point 1



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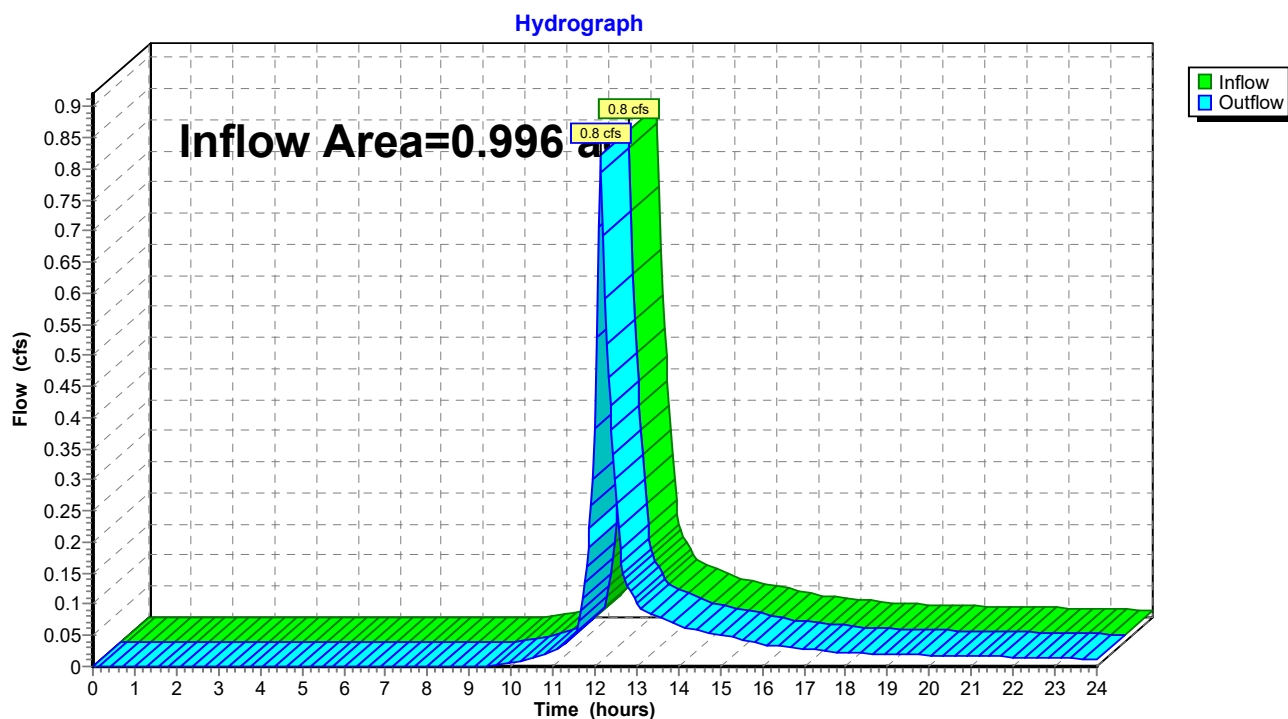
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Summary for Reach DP-2: Design Point 2

Inflow Area = 0.996 ac, 59.15% Impervious, Inflow Depth > 0.79" for 10-Yr 24 Hr event
Inflow = 0.8 cfs @ 12.13 hrs, Volume= 0.066 af
Outflow = 0.8 cfs @ 12.13 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-2: Design Point 2



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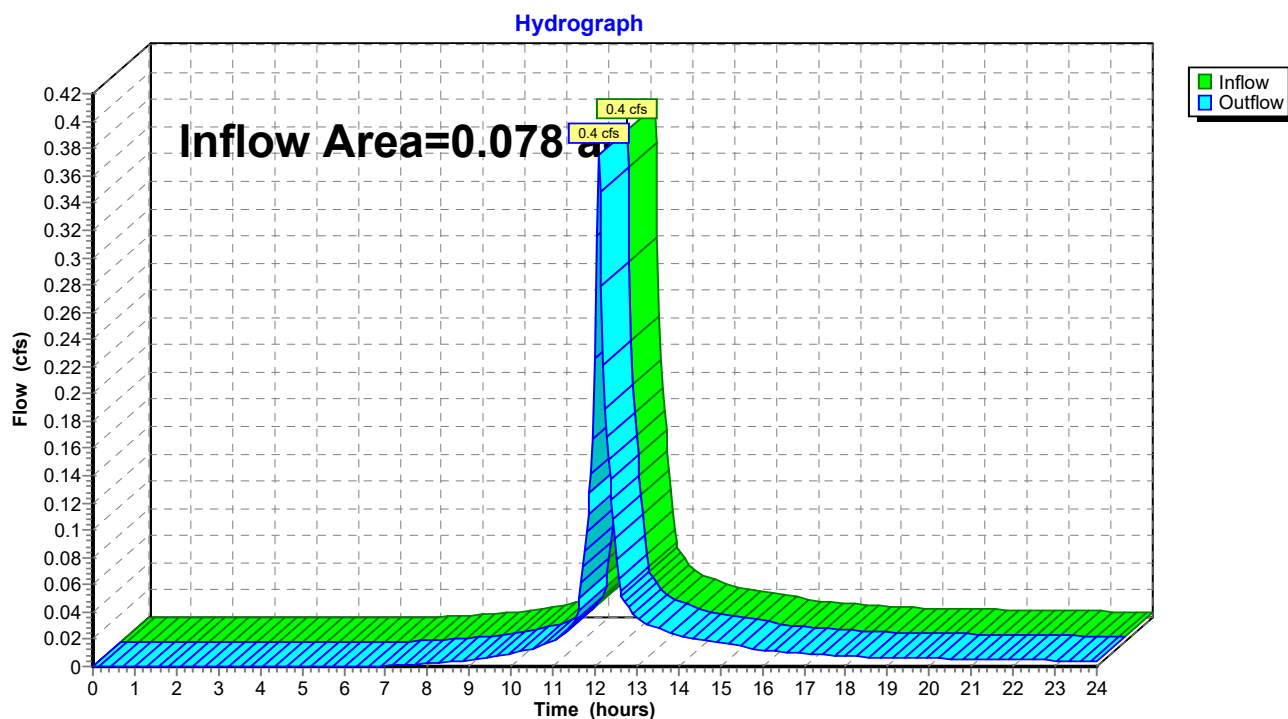
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Summary for Reach DP-3: Design Point 3

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth > 4.17" for 10-Yr 24 Hr event
Inflow = 0.4 cfs @ 12.09 hrs, Volume= 0.027 af
Outflow = 0.4 cfs @ 12.09 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-3: Design Point 3



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Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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Summary for Pond PSIS: PSIS

Inflow Area = 0.718 ac, 80.26% Impervious, Inflow Depth > 5.26" for 10-Yr 24 Hr event
 Inflow = 4.2 cfs @ 12.09 hrs, Volume= 0.315 af
 Outflow = 0.2 cfs @ 10.24 hrs, Volume= 0.216 af, Atten= 96%, Lag= 0.0 min
 Discarded = 0.2 cfs @ 10.24 hrs, Volume= 0.216 af
 Primary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 84.97' @ 15.18 hrs Surf.Area= 2,958 sf Storage= 7,235 cf

Plug-Flow detention time= 270.8 min calculated for 0.216 af (69% of inflow)
 Center-of-Mass det. time= 178.2 min (960.2 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	81.50'	5,019 cf	83.00'W x 35.64'L x 6.75'H Field A 19,968 cf Overall - 7,420 cf Embedded = 12,548 cf x 40.0% Voids
#2A	82.25'	7,420 cf	ADS_StormTech MC-4500 b +Cap x 63 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 63 Chambers in 9 Rows Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf
		12,439 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	81.50'	2.410 in/hr Exfiltration over Surface area
#2	Device 3	86.67'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	86.67'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.67' / 86.50' S= 0.0340 ' S= 0.0340 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.2 cfs @ 10.24 hrs HW=81.57' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=81.50' (Free Discharge)
 ↑ **3=Culvert** (Controls 0.0 cfs)
 ↑ **2=Orifice/Grate** (Controls 0.0 cfs)

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Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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Pond PSIS: PSIS - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

7 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 33.64' Row Length +12.0" End Stone x 2 = 35.64' Base Length

9 Rows x 100.0" Wide + 9.0" Spacing x 8 + 12.0" Side Stone x 2 = 83.00' Base Width

9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

63 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 9 Rows = 7,419.9 cf Chamber Storage

19,968.2 cf Field - 7,419.9 cf Chambers = 12,548.3 cf Stone x 40.0% Voids = 5,019.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,439.2 cf = 0.286 af

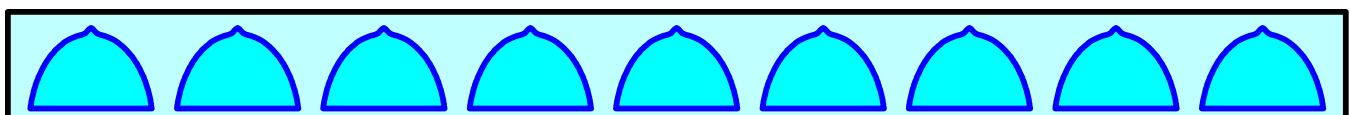
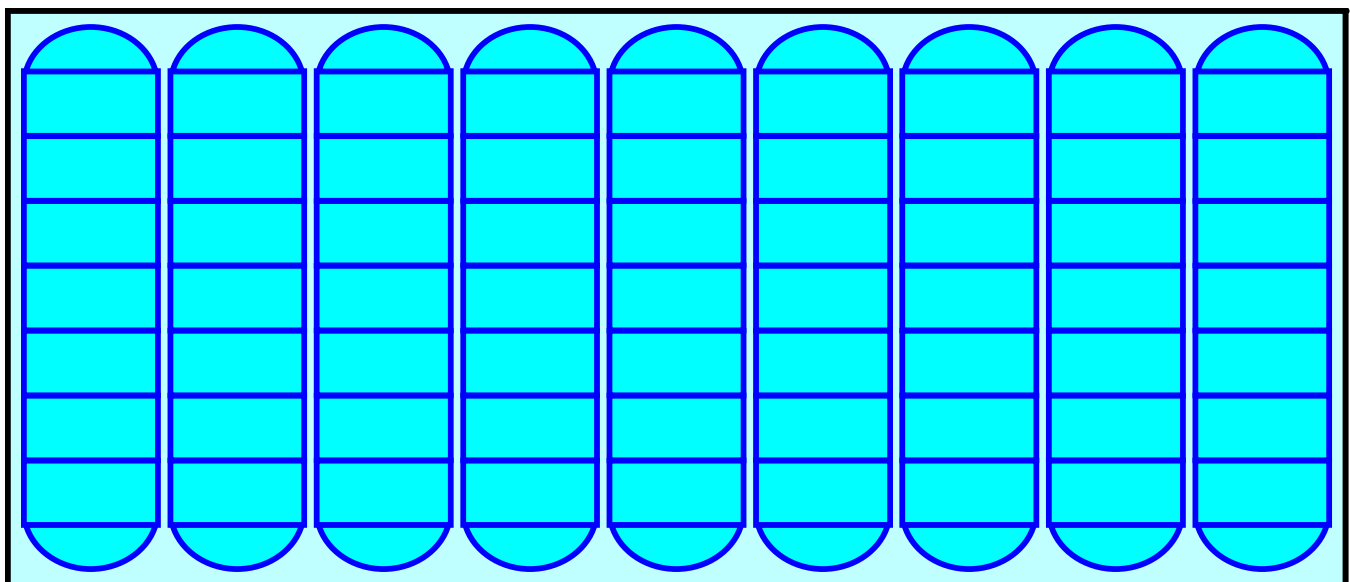
Overall Storage Efficiency = 62.3%

Overall System Size = 35.64' x 83.00' x 6.75'

63 Chambers

739.6 cy Field

464.8 cy Stone



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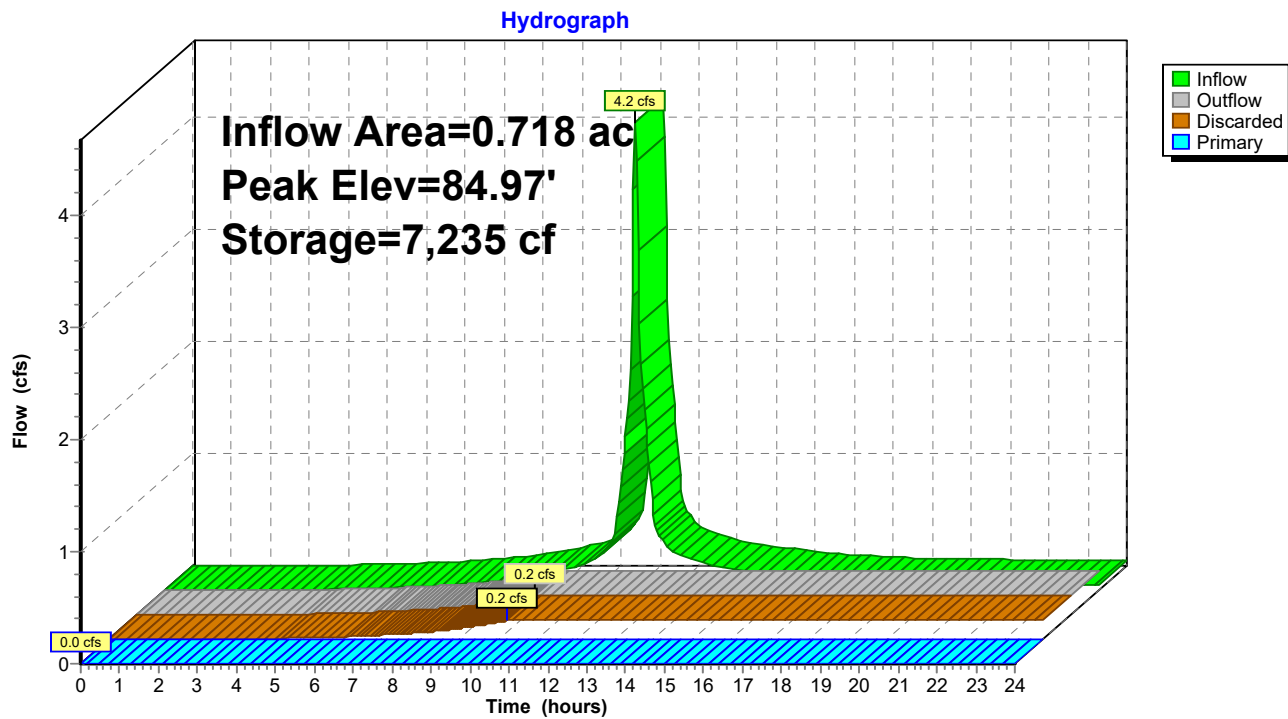
Proposed Conditions

Type III 24-hr 10-Yr 24 Hr Rainfall=6.43"

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Pond PSIS: PSIS



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Proposed Conditions

Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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Summary for Subcatchment SC-101: Subcatchment 101

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 0.051 af, Depth> 6.46"
 Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

Area (sf)	CN	Description
1,288	39	>75% Grass cover, Good, HSG A
* 2,243	98	Proposed Driveway
* 218	98	Existing Roof
406	39	>75% Grass cover, Good, HSG A
4,155	74	Weighted Average
1,694		40.77% Pervious Area
2,461		59.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	25	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
0.4	25	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.01"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7					Direct Entry, Min. Engineering Practice
6.0	52	Total			

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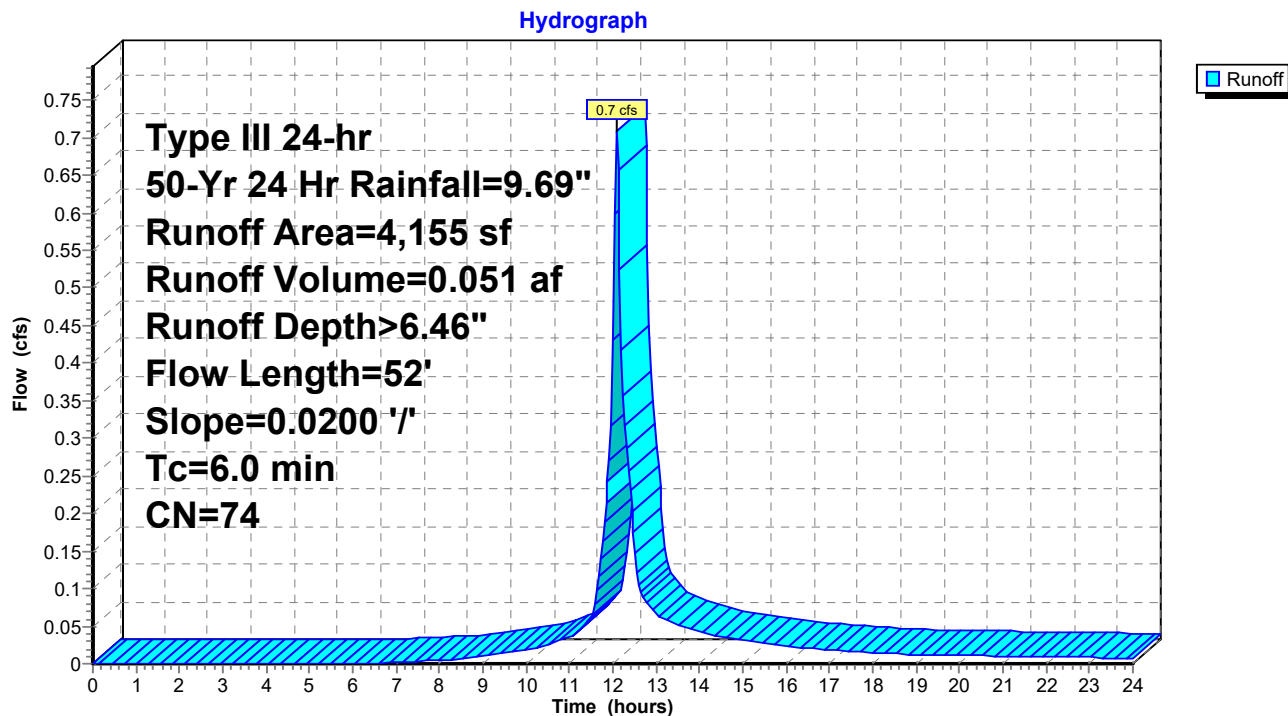
Proposed Conditions

Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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Subcatchment SC-101: Subcatchment 101



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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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Summary for Subcatchment SC-201: Subcatchment 201

Runoff = 1.6 cfs @ 12.13 hrs, Volume= 0.128 af, Depth> 5.55"
 Routed to Reach DP-2 : Design Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

Area (sf)	CN	Description
4,295	39	>75% Grass cover, Good, HSG A
* 791	96	Proposed Stone Dust Walkway
6,455	80	>75% Grass cover, Good, HSG D
* 218	98	Existing Roof
* 322	98	Existing Roof
12,081	67	Weighted Average
11,541		95.53% Pervious Area
540		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0570	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
4.8	89	0.0700	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
1.0	26	0.3300	0.4		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
9.1	165	Total			

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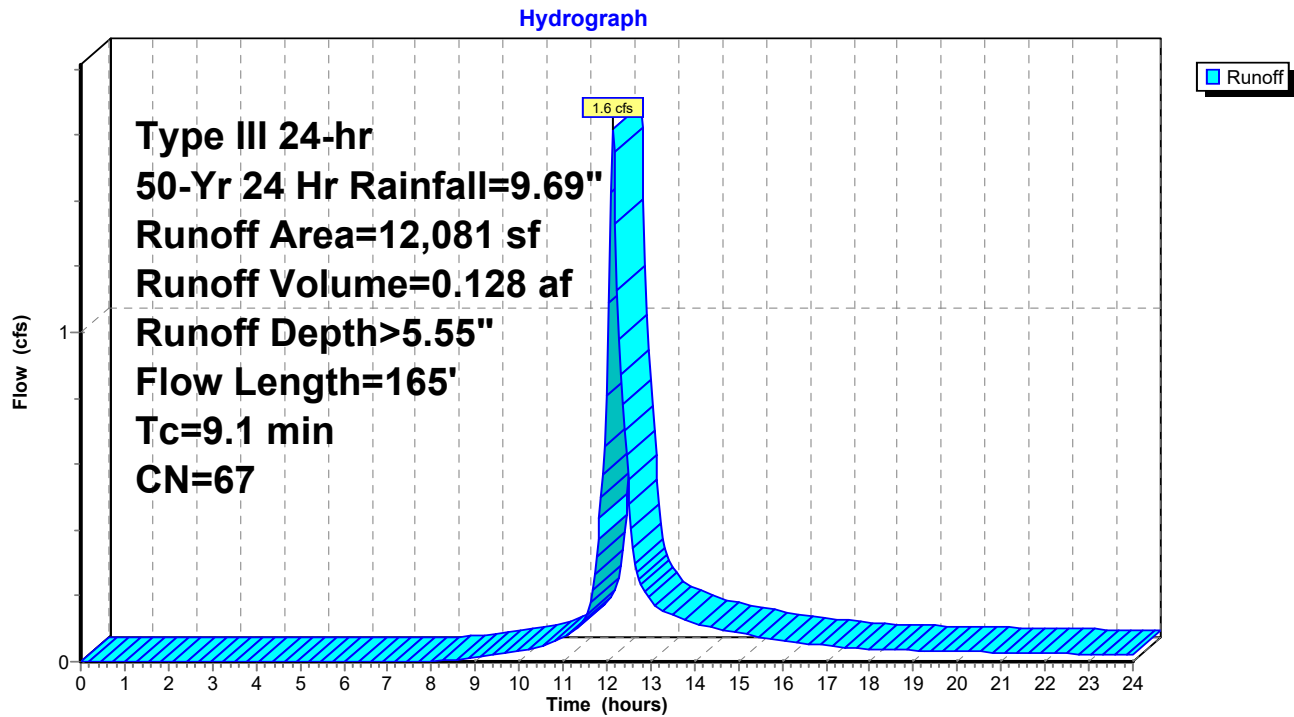
Proposed Conditions

Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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Subcatchment SC-201: Subcatchment 201



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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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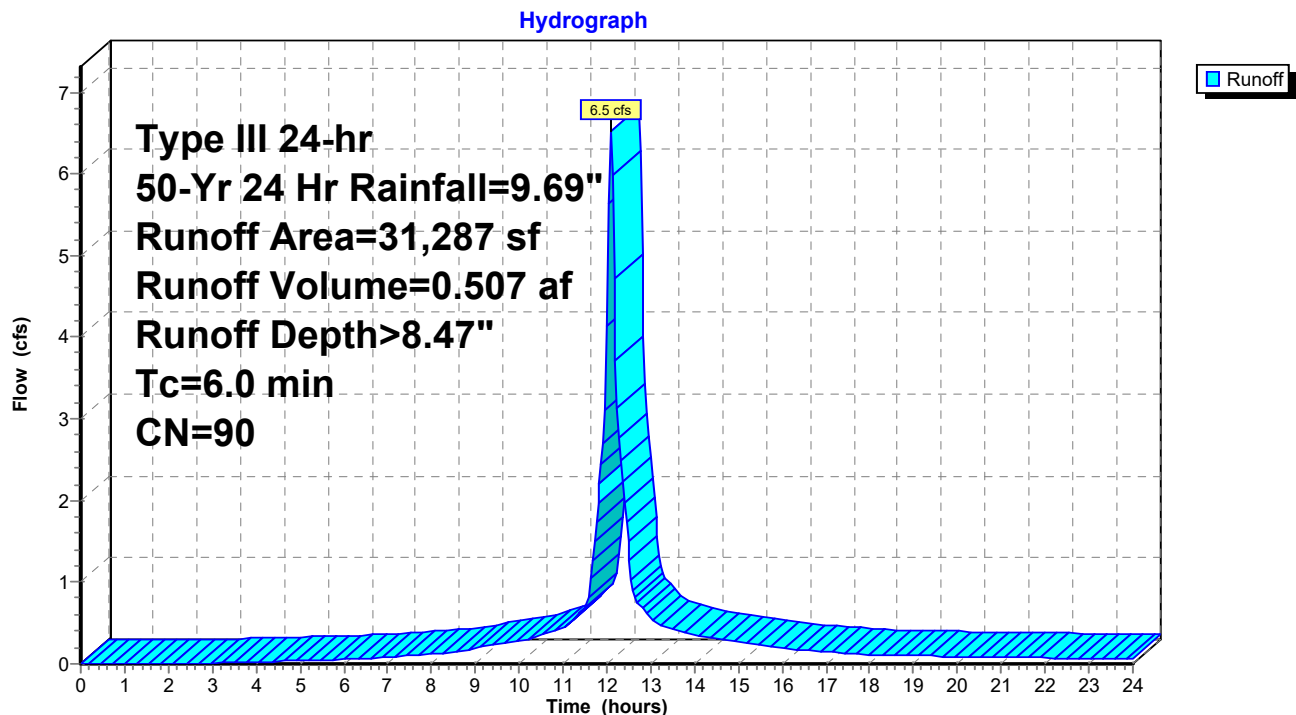
Summary for Subcatchment SC-202: Subcatchment 202

Runoff = 6.5 cfs @ 12.08 hrs, Volume= 0.507 af, Depth> 8.47"
 Routed to Pond PSIS : PSIS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

	Area (sf)	CN	Description
*	24,400	98	Proposed Roof Area
	3,872	39	>75% Grass cover, Good, HSG A
	1,583	80	>75% Grass cover, Good, HSG D
*	720	96	Proposed Stone Dust Walkway
*	712	98	Proposed Bit. Conc. Walkway
	31,287	90	Weighted Average
	6,175		19.74% Pervious Area
	25,112		80.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. Engineering Standard

Subcatchment SC-202: Subcatchment 202

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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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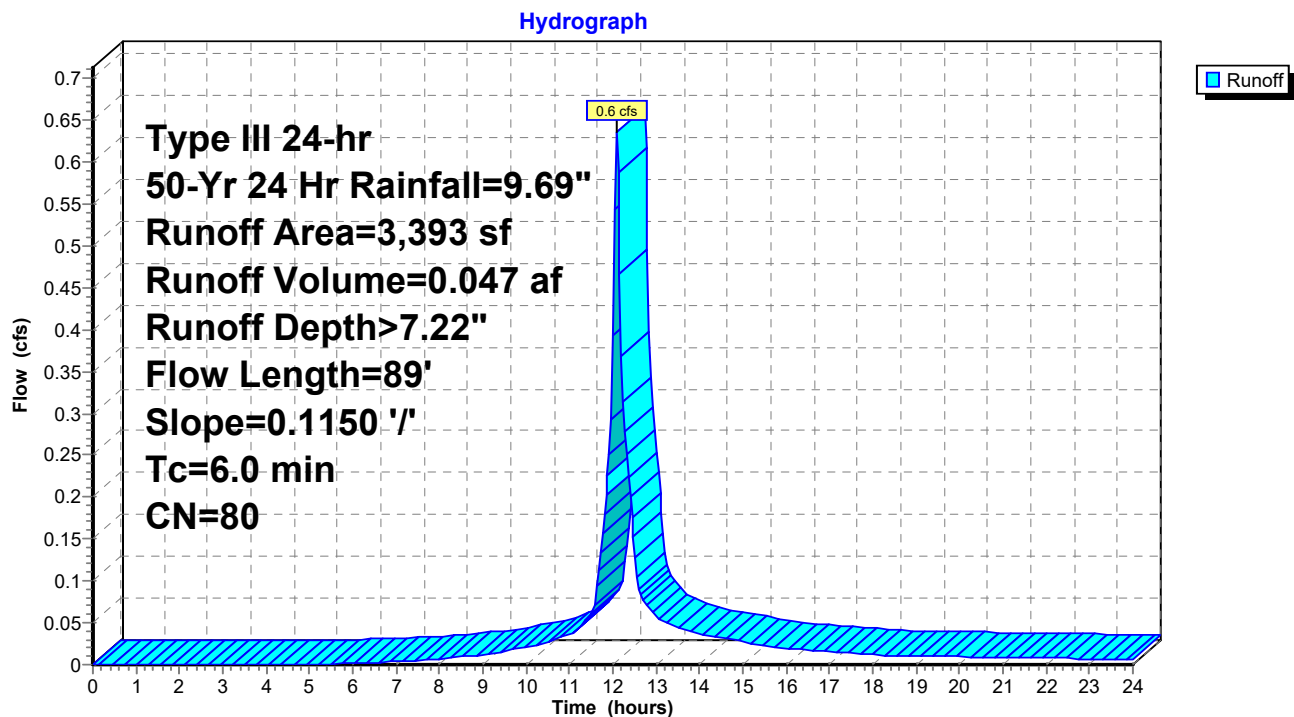
Summary for Subcatchment SC-301: Subcatchment 301

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 0.047 af, Depth> 7.22"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

Area (sf)	CN	Description
3,393	80	>75% Grass cover, Good, HSG D
3,393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.1150	0.2		Sheet Flow,
					Grass: Dense n= 0.240 P2= 4.01"
0.4	39	0.1150	1.7		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
2.0					Direct Entry, Min. Engineering Practice
6.0	89	Total			

Subcatchment SC-301: Subcatchment 301

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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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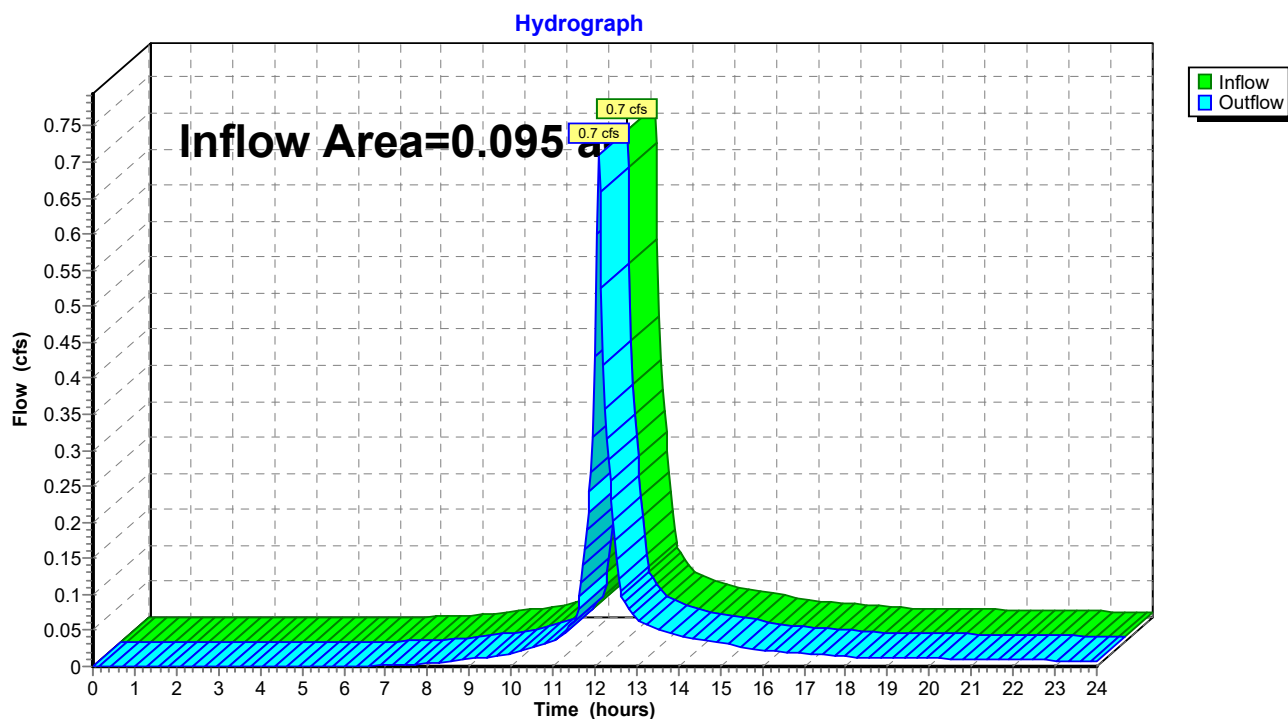
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Summary for Reach DP-1: Design Point 1

Inflow Area = 0.095 ac, 59.23% Impervious, Inflow Depth > 6.46" for 50-Yr 24 Hr event
Inflow = 0.7 cfs @ 12.09 hrs, Volume= 0.051 af
Outflow = 0.7 cfs @ 12.09 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-1: Design Point 1



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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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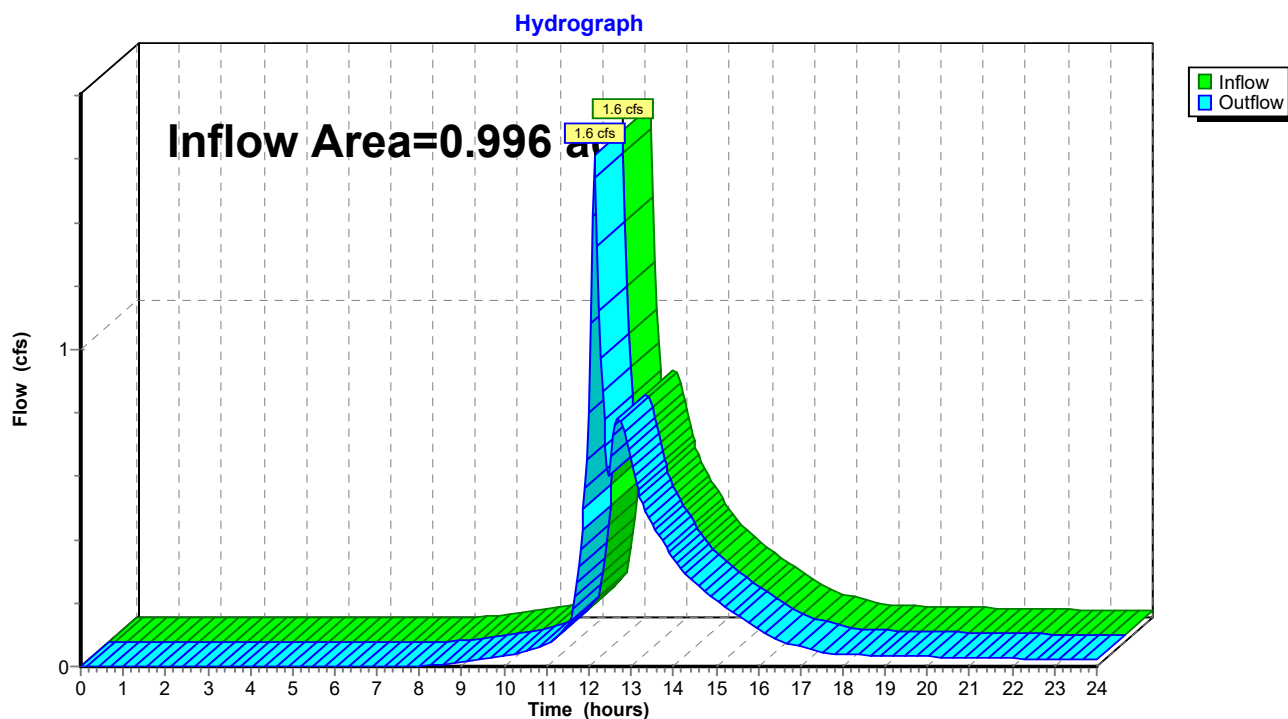
Page 34

Summary for Reach DP-2: Design Point 2

Inflow Area = 0.996 ac, 59.15% Impervious, Inflow Depth > 2.38" for 50-Yr 24 Hr event
Inflow = 1.6 cfs @ 12.13 hrs, Volume= 0.198 af
Outflow = 1.6 cfs @ 12.13 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-2: Design Point 2



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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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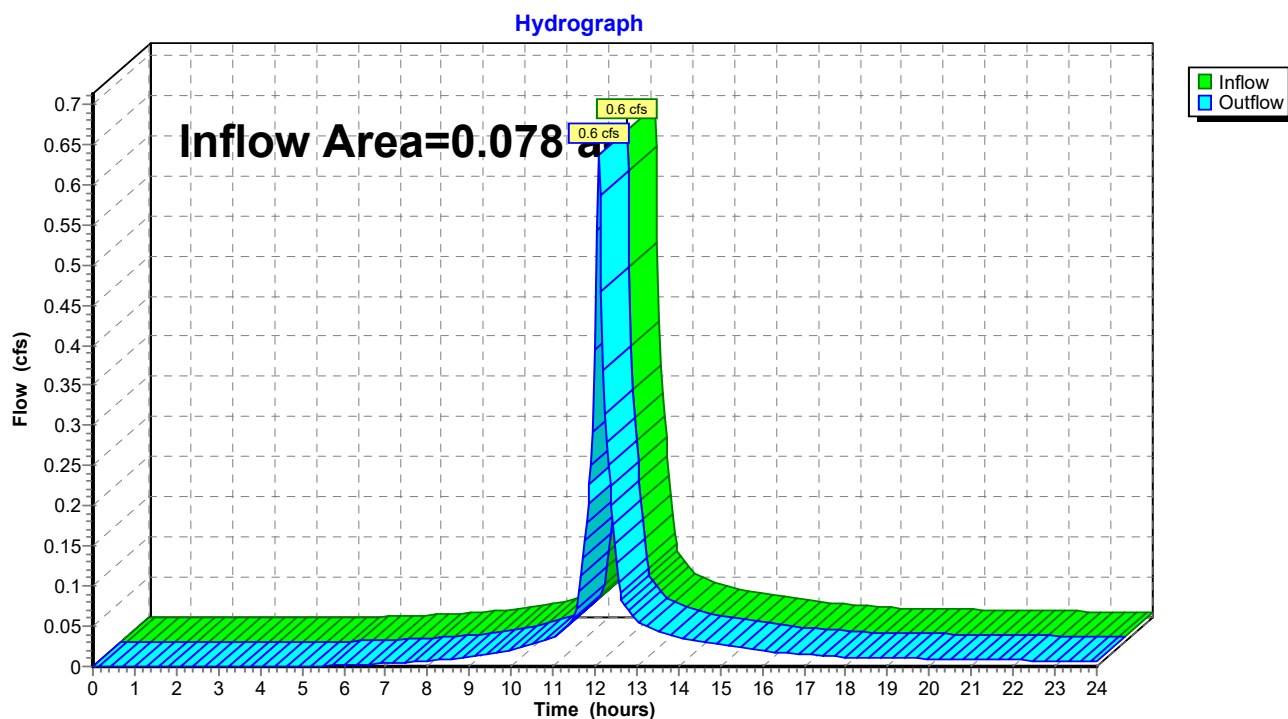
Page 35

Summary for Reach DP-3: Design Point 3

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth > 7.22" for 50-Yr 24 Hr event
Inflow = 0.6 cfs @ 12.09 hrs, Volume= 0.047 af
Outflow = 0.6 cfs @ 12.09 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-3: Design Point 3



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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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Summary for Pond PSIS: PSIS

Inflow Area = 0.718 ac, 80.26% Impervious, Inflow Depth > 8.47" for 50-Yr 24 Hr event
 Inflow = 6.5 cfs @ 12.08 hrs, Volume= 0.507 af
 Outflow = 0.7 cfs @ 12.77 hrs, Volume= 0.308 af, Atten= 89%, Lag= 41.4 min
 Discarded = 0.2 cfs @ 8.76 hrs, Volume= 0.238 af
 Primary = 0.5 cfs @ 12.77 hrs, Volume= 0.070 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 87.09' @ 12.77 hrs Surf.Area= 2,958 sf Storage= 11,058 cf

Plug-Flow detention time= 226.5 min calculated for 0.308 af (61% of inflow)
 Center-of-Mass det. time= 122.8 min (892.9 - 770.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	81.50'	5,019 cf	83.00'W x 35.64'L x 6.75'H Field A 19,968 cf Overall - 7,420 cf Embedded = 12,548 cf x 40.0% Voids
#2A	82.25'	7,420 cf	ADS_StormTech MC-4500 b +Cap x 63 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 63 Chambers in 9 Rows Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf
		12,439 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	81.50'	2.410 in/hr Exfiltration over Surface area
#2	Device 3	86.67'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	86.67'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.67' / 86.50' S= 0.0340 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.2 cfs @ 8.76 hrs HW=81.57' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=0.5 cfs @ 12.77 hrs HW=87.09' (Free Discharge)
 ↑ **3=Culvert** (Inlet Controls 0.5 cfs @ 1.7 fps)
 ↑ **2=Orifice/Grate** (Passes 0.5 cfs of 0.8 cfs potential flow)

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Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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Pond PSIS: PSIS - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

7 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 33.64' Row Length +12.0" End Stone x 2 = 35.64' Base Length

9 Rows x 100.0" Wide + 9.0" Spacing x 8 + 12.0" Side Stone x 2 = 83.00' Base Width

9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

63 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 9 Rows = 7,419.9 cf Chamber Storage

19,968.2 cf Field - 7,419.9 cf Chambers = 12,548.3 cf Stone x 40.0% Voids = 5,019.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,439.2 cf = 0.286 af

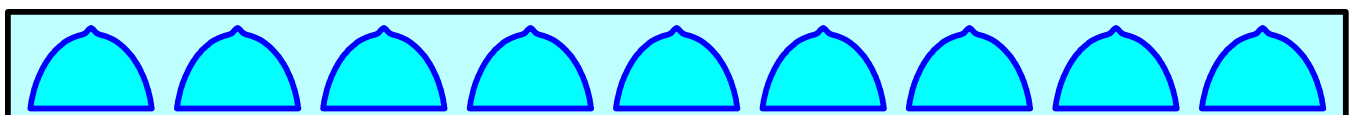
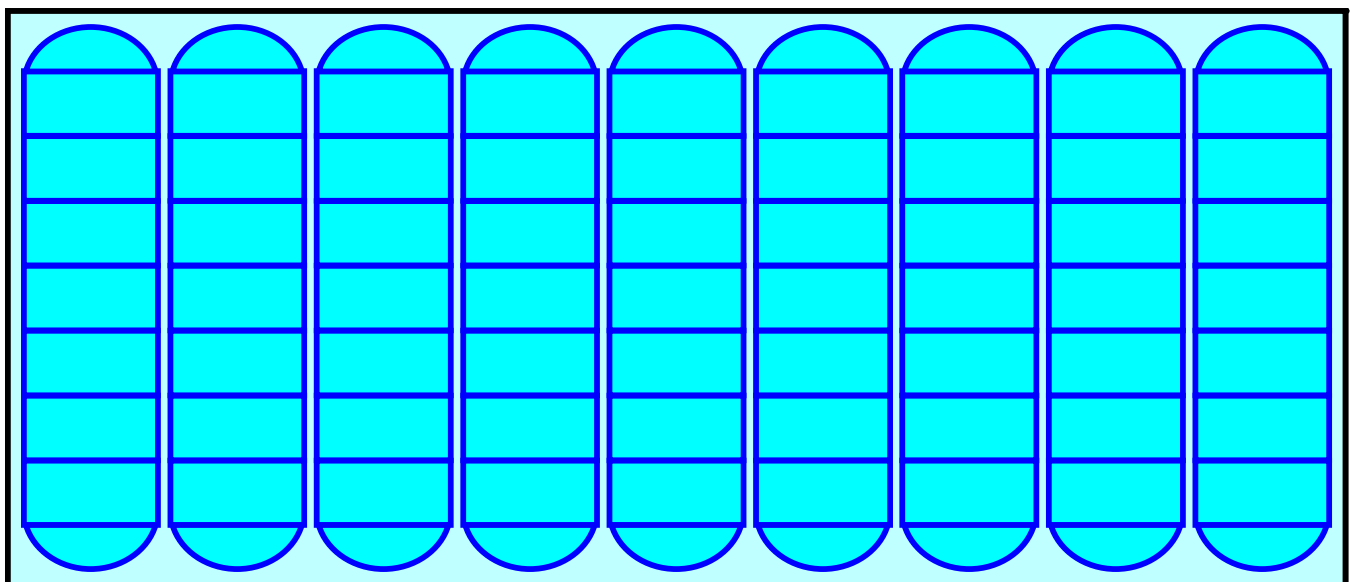
Overall Storage Efficiency = 62.3%

Overall System Size = 35.64' x 83.00' x 6.75'

63 Chambers

739.6 cy Field

464.8 cy Stone



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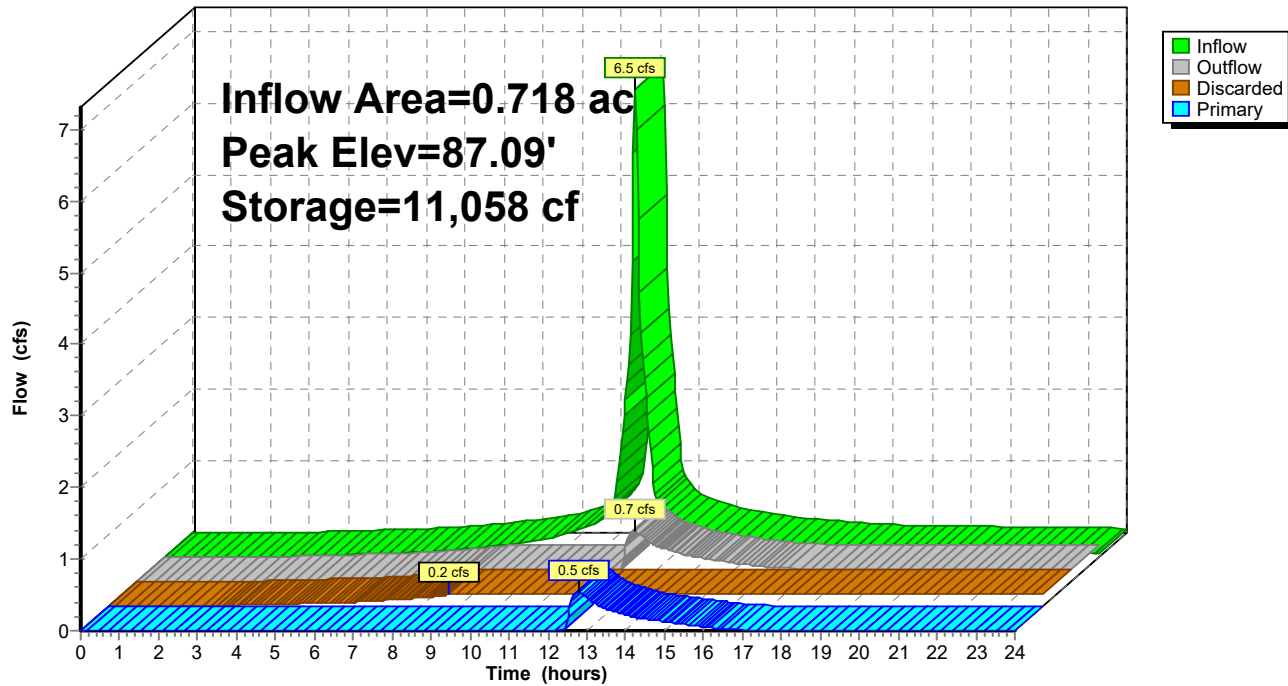
Type III 24-hr 50-Yr 24 Hr Rainfall=9.69"

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Pond PSIS: PSIS

Hydrograph



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Proposed Conditions

Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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Summary for Subcatchment SC-101: Subcatchment 101

Runoff = 0.9 cfs @ 12.09 hrs, Volume= 0.065 af, Depth> 8.14"
 Routed to Reach DP-1 : Design Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Area (sf)	CN	Description
1,288	39	>75% Grass cover, Good, HSG A
* 2,243	98	Proposed Driveway
* 218	98	Existing Roof
406	39	>75% Grass cover, Good, HSG A
4,155	74	Weighted Average
1,694		40.77% Pervious Area
2,461		59.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.9	25	0.0200	0.1		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
0.4	25	0.0200	1.2		Sheet Flow, Smooth surfaces n= 0.011 P2= 4.01"
0.0	2	0.0200	2.9		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.7					Direct Entry, Min. Engineering Practice
6.0	52	Total			

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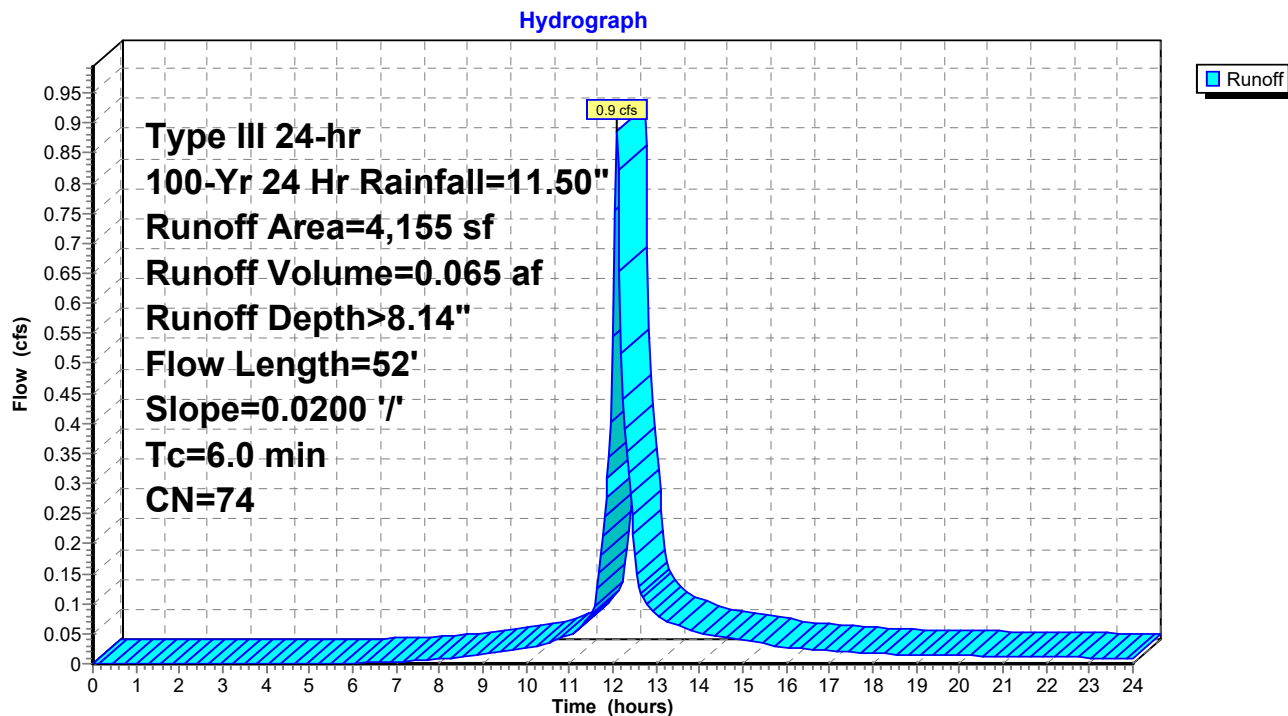
Proposed Conditions

Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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Subcatchment SC-101: Subcatchment 101



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Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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Summary for Subcatchment SC-201: Subcatchment 201

Runoff = 2.1 cfs @ 12.13 hrs, Volume= 0.165 af, Depth> 7.15"
 Routed to Reach DP-2 : Design Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Area (sf)	CN	Description
4,295	39	>75% Grass cover, Good, HSG A
* 791	96	Proposed Stone Dust Walkway
6,455	80	>75% Grass cover, Good, HSG D
* 218	98	Existing Roof
* 322	98	Existing Roof
12,081	67	Weighted Average
11,541		95.53% Pervious Area
540		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0570	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
4.8	89	0.0700	0.3		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
1.0	26	0.3300	0.4		Sheet Flow, Grass: Short n= 0.150 P2= 4.01"
9.1	165	Total			

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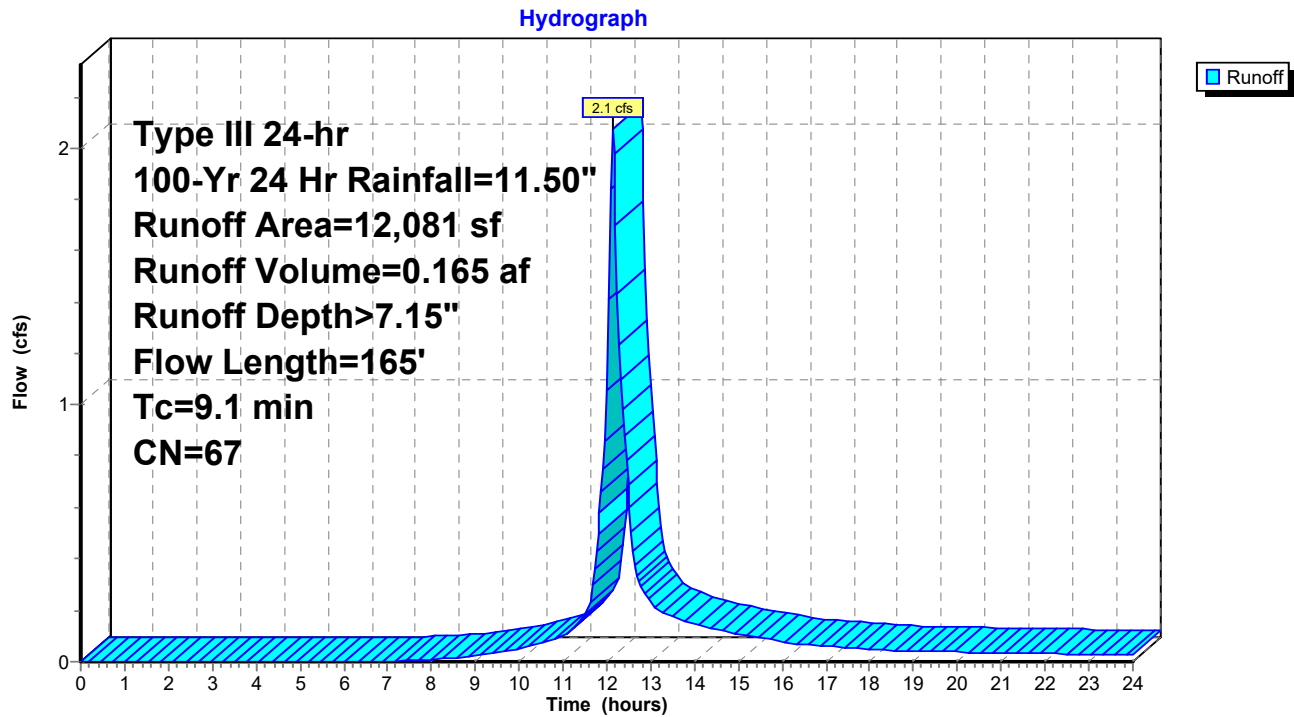
Proposed Conditions

Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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Subcatchment SC-201: Subcatchment 201



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Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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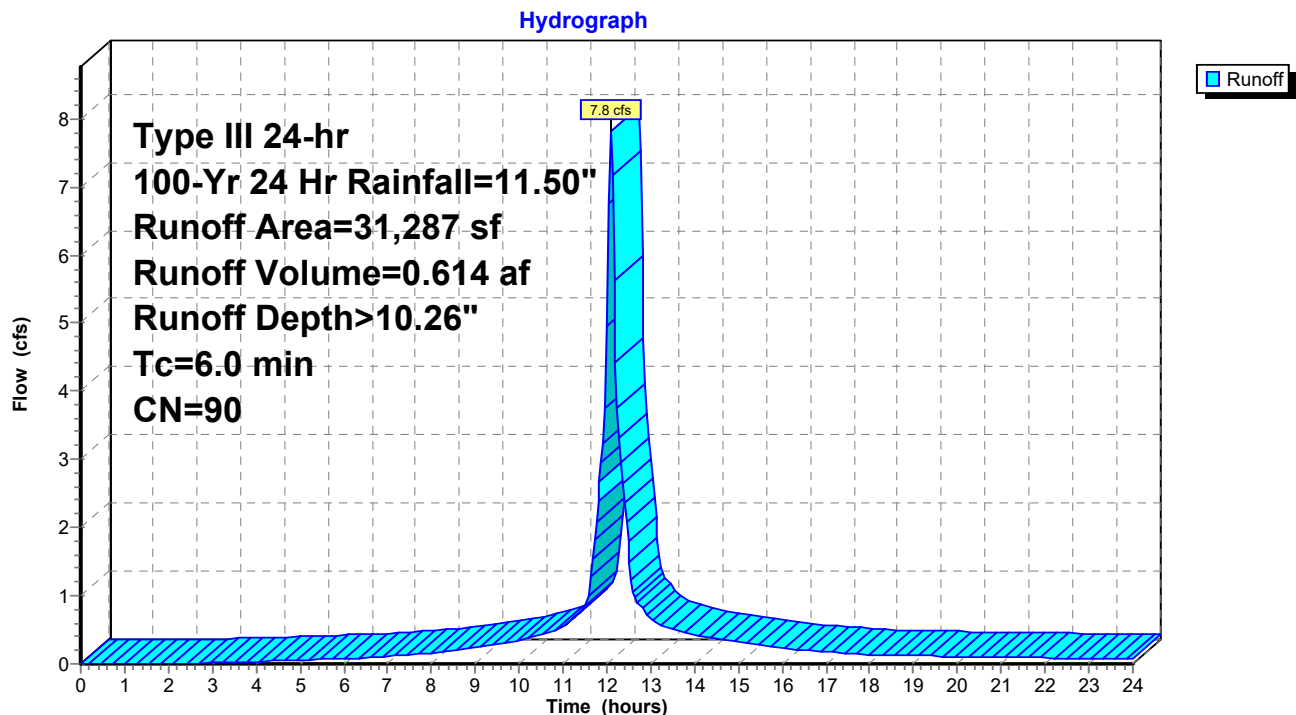
Summary for Subcatchment SC-202: Subcatchment 202

Runoff = 7.8 cfs @ 12.08 hrs, Volume= 0.614 af, Depth>10.26"
Routed to Pond PSIS : PSIS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

	Area (sf)	CN	Description
*	24,400	98	Proposed Roof Area
	3,872	39	>75% Grass cover, Good, HSG A
	1,583	80	>75% Grass cover, Good, HSG D
*	720	96	Proposed Stone Dust Walkway
*	712	98	Proposed Bit. Conc. Walkway
	31,287	90	Weighted Average
	6,175		19.74% Pervious Area
	25,112		80.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. Engineering Standard

Subcatchment SC-202: Subcatchment 202

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Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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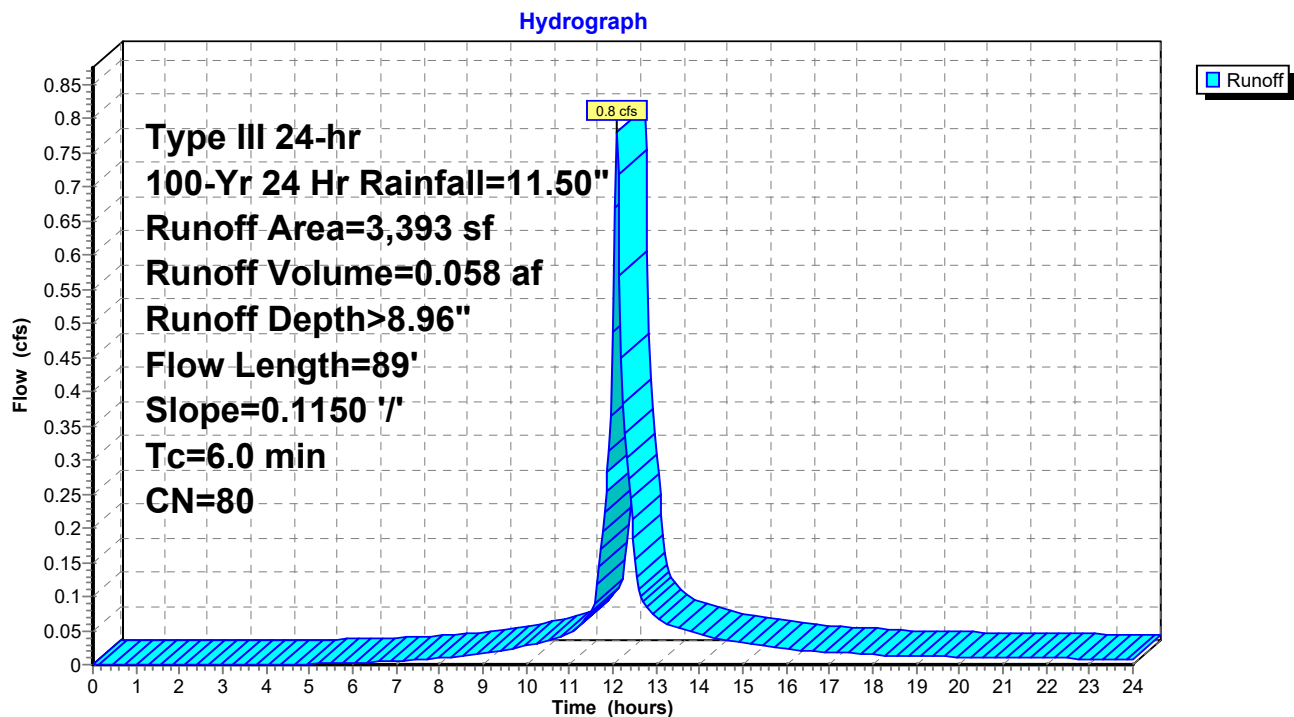
Summary for Subcatchment SC-301: Subcatchment 301

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 8.96"
 Routed to Reach DP-3 : Design Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Area (sf)	CN	Description
3,393	80	>75% Grass cover, Good, HSG D
3,393		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.1150	0.2		Sheet Flow,
					Grass: Dense n= 0.240 P2= 4.01"
0.4	39	0.1150	1.7		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
2.0					Direct Entry, Min. Engineering Practice
6.0	89	Total			

Subcatchment SC-301: Subcatchment 301

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Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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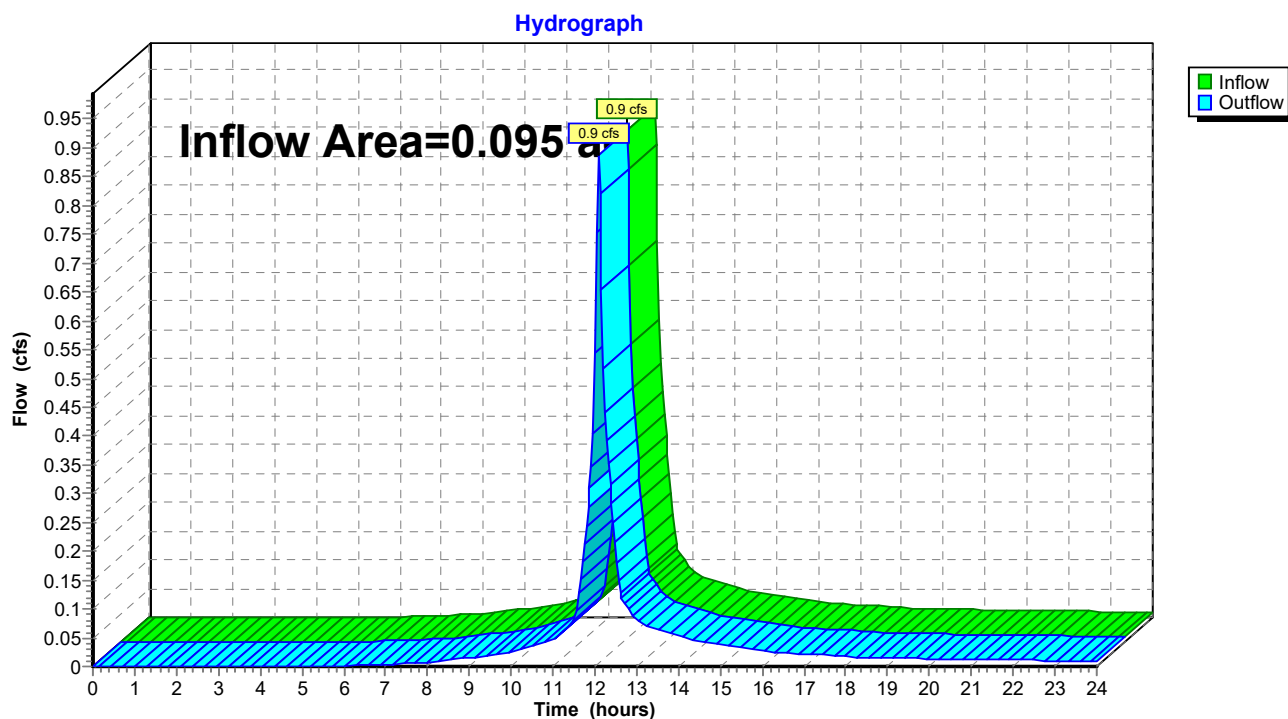
Page 45

Summary for Reach DP-1: Design Point 1

Inflow Area = 0.095 ac, 59.23% Impervious, Inflow Depth > 8.14" for 100-Yr 24 Hr event
Inflow = 0.9 cfs @ 12.09 hrs, Volume= 0.065 af
Outflow = 0.9 cfs @ 12.09 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-1: Design Point 1



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Proposed Conditions

Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Printed 4/14/2023

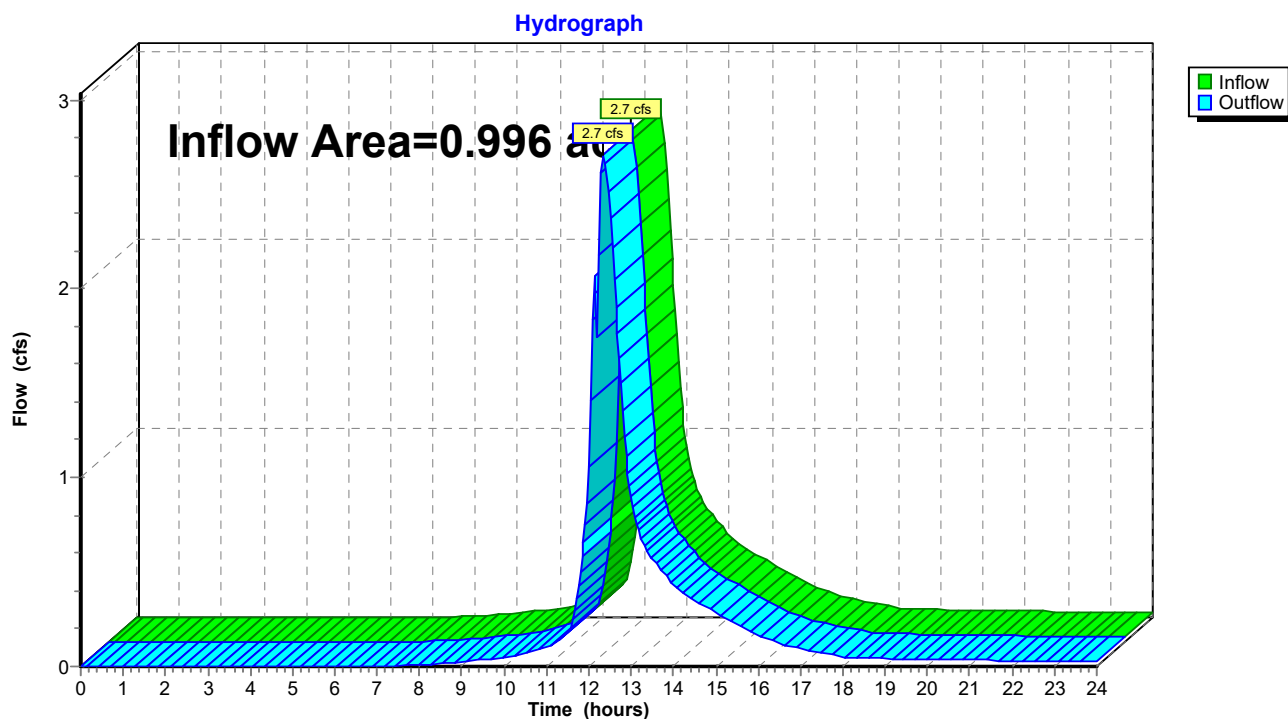
Page 46

Summary for Reach DP-2: Design Point 2

Inflow Area = 0.996 ac, 59.15% Impervious, Inflow Depth > 3.88" for 100-Yr 24 Hr event
Inflow = 2.7 cfs @ 12.35 hrs, Volume= 0.322 af
Outflow = 2.7 cfs @ 12.35 hrs, Volume= 0.322 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-2: Design Point 2



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Proposed Conditions

Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Printed 4/14/2023

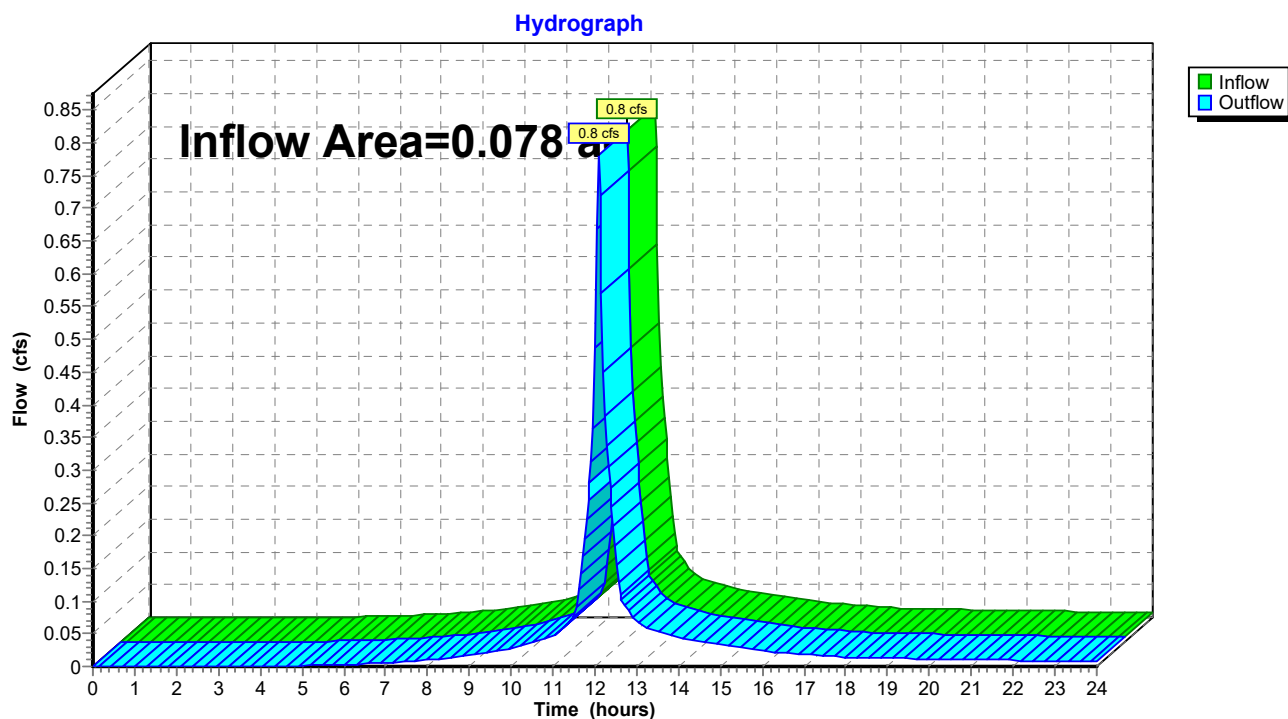
Page 47

Summary for Reach DP-3: Design Point 3

Inflow Area = 0.078 ac, 0.00% Impervious, Inflow Depth > 8.96" for 100-Yr 24 Hr event
Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.058 af
Outflow = 0.8 cfs @ 12.09 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Reach DP-3: Design Point 3



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Proposed Conditions

Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

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Summary for Pond PSIS: PSIS

Inflow Area = 0.718 ac, 80.26% Impervious, Inflow Depth > 10.26" for 100-Yr 24 Hr event
 Inflow = 7.8 cfs @ 12.08 hrs, Volume= 0.614 af
 Outflow = 2.0 cfs @ 12.45 hrs, Volume= 0.405 af, Atten= 75%, Lag= 22.1 min
 Discarded = 0.2 cfs @ 8.28 hrs, Volume= 0.248 af
 Primary = 1.8 cfs @ 12.45 hrs, Volume= 0.157 af
 Routed to Reach DP-2 : Design Point 2

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
 Peak Elev= 87.85' @ 12.45 hrs Surf.Area= 2,958 sf Storage= 11,971 cf

Plug-Flow detention time= 188.3 min calculated for 0.405 af (66% of inflow)
 Center-of-Mass det. time= 90.6 min (856.1 - 765.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	81.50'	5,019 cf	83.00'W x 35.64'L x 6.75'H Field A 19,968 cf Overall - 7,420 cf Embedded = 12,548 cf x 40.0% Voids
#2A	82.25'	7,420 cf	ADS_StormTech MC-4500 b +Capx 63 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 63 Chambers in 9 Rows Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf
		12,439 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	81.50'	2.410 in/hr Exfiltration over Surface area
#2	Device 3	86.67'	6.0" Vert. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	86.67'	12.0" Round Culvert L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 86.67' / 86.50' S= 0.0340 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.2 cfs @ 8.28 hrs HW=81.57' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.2 cfs)

Primary OutFlow Max=1.8 cfs @ 12.45 hrs HW=87.85' (Free Discharge)
 ↑ **3=Culvert** (Passes 1.8 cfs of 2.5 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 1.8 cfs @ 4.6 fps)

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Proposed Conditions

Type III 24-hr 100-Yr 24 Hr Rainfall=11.50"

Printed 4/14/2023

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Pond PSIS: PSIS - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 b +Cap (ADS StormTech®MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= 39.5 cf x 2 x 9 rows = 711.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

7 Chambers/Row x 4.02' Long +2.73' Cap Length x 2 = 33.64' Row Length +12.0" End Stone x 2 = 35.64' Base Length

9 Rows x 100.0" Wide + 9.0" Spacing x 8 + 12.0" Side Stone x 2 = 83.00' Base Width

9.0" Stone Base + 60.0" Chamber Height + 12.0" Stone Cover = 6.75' Field Height

63 Chambers x 106.5 cf + 39.5 cf Cap Volume x 2 x 9 Rows = 7,419.9 cf Chamber Storage

19,968.2 cf Field - 7,419.9 cf Chambers = 12,548.3 cf Stone x 40.0% Voids = 5,019.3 cf Stone Storage

Chamber Storage + Stone Storage = 12,439.2 cf = 0.286 af

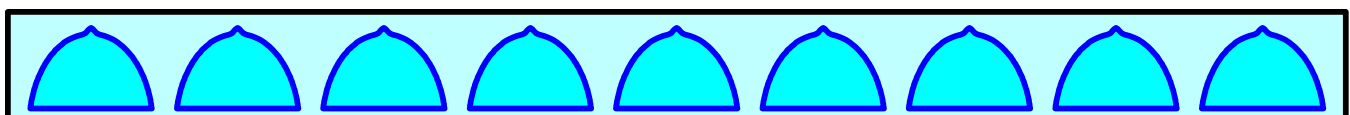
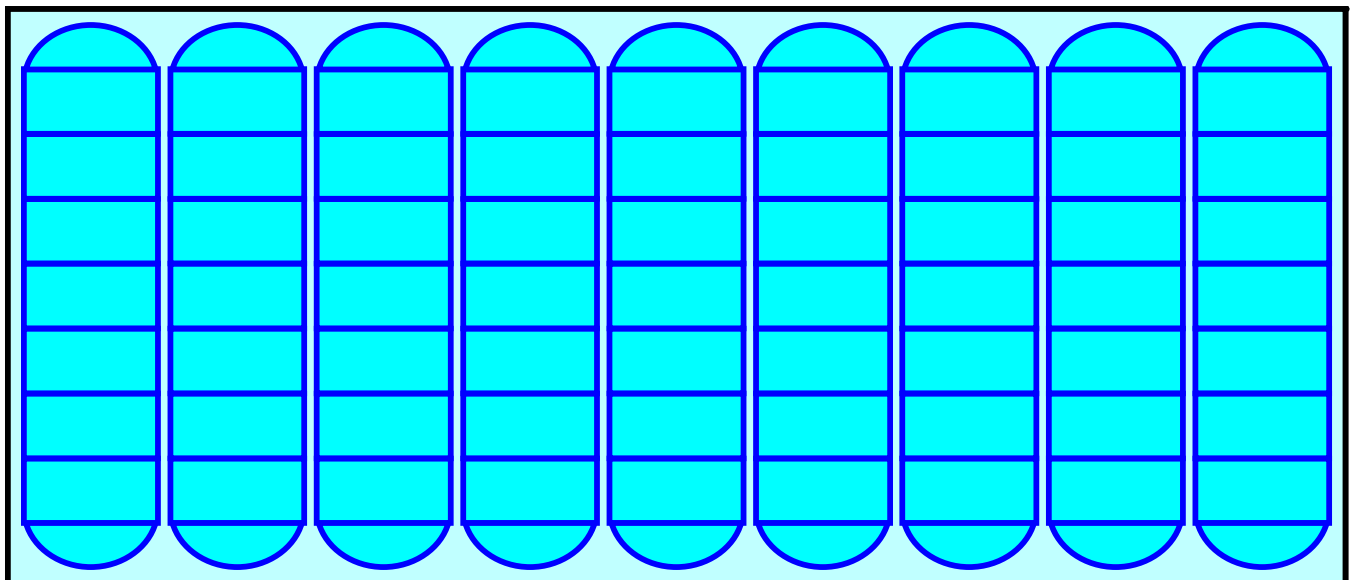
Overall Storage Efficiency = 62.3%

Overall System Size = 35.64' x 83.00' x 6.75'

63 Chambers

739.6 cy Field

464.8 cy Stone



21583-POST_SM Bldg

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Proposed Conditions

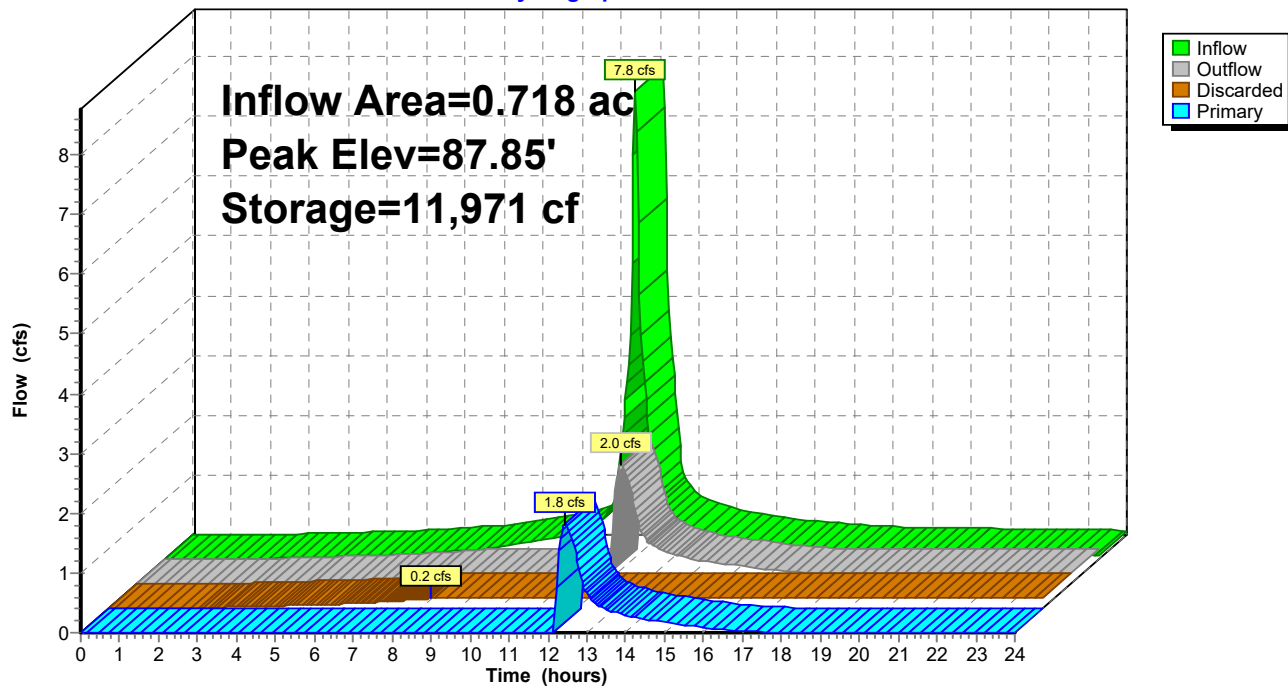
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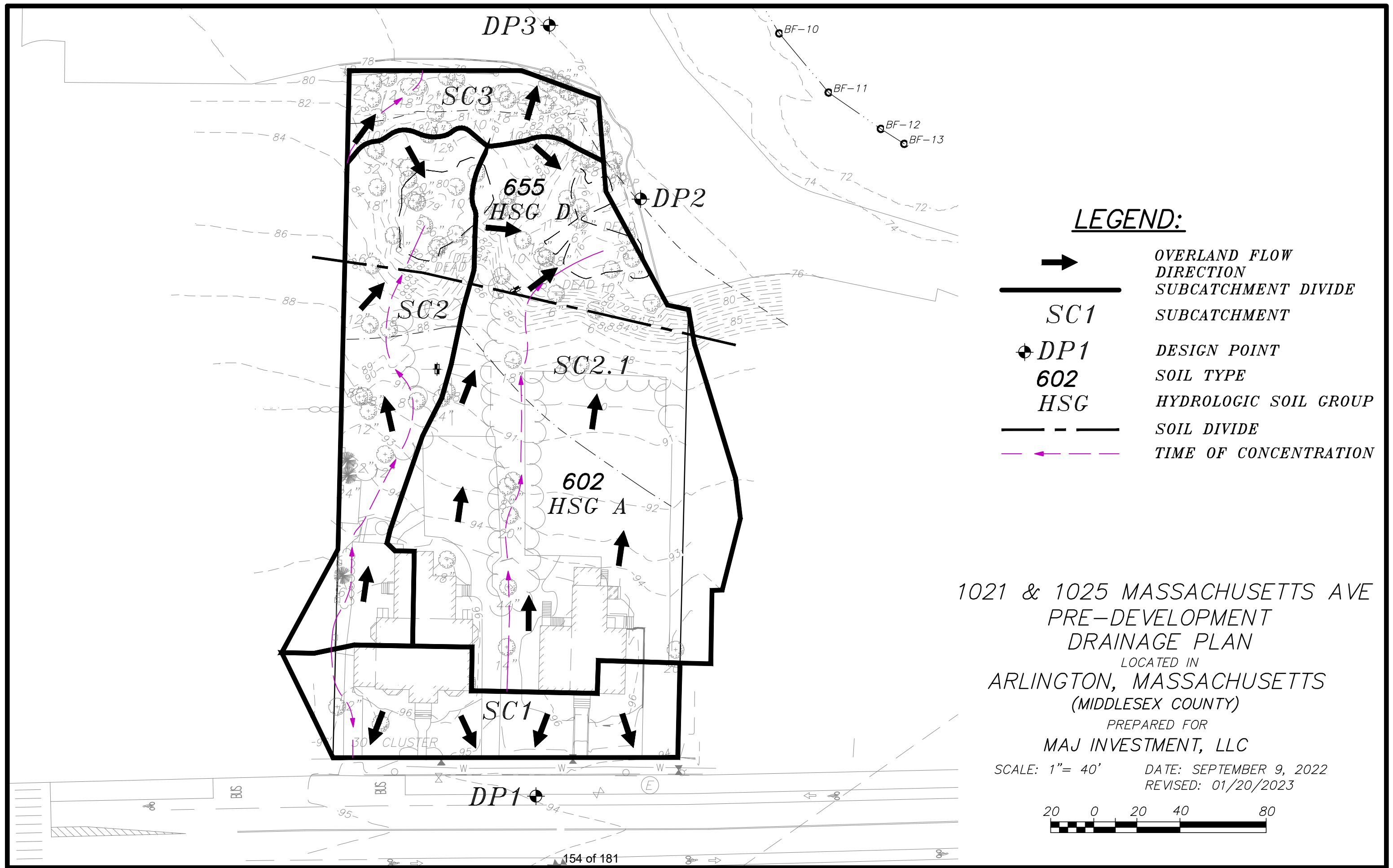
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Pond PSIS: PSIS

Hydrograph





LEGEND:

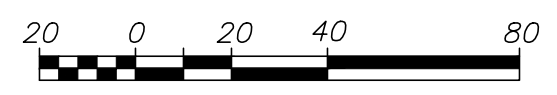
-  OVERLAND FLOW DIRECTION
-  SUBCATCHMENT DIVIDE
-  SUBCATCHMENT
-  DP1 DESIGN POINT
-  602 SOIL TYPE
-  HSG HYDROLOGIC SOIL GROUP
-  SOIL DIVIDE
-  TIME OF CONCENTRATION

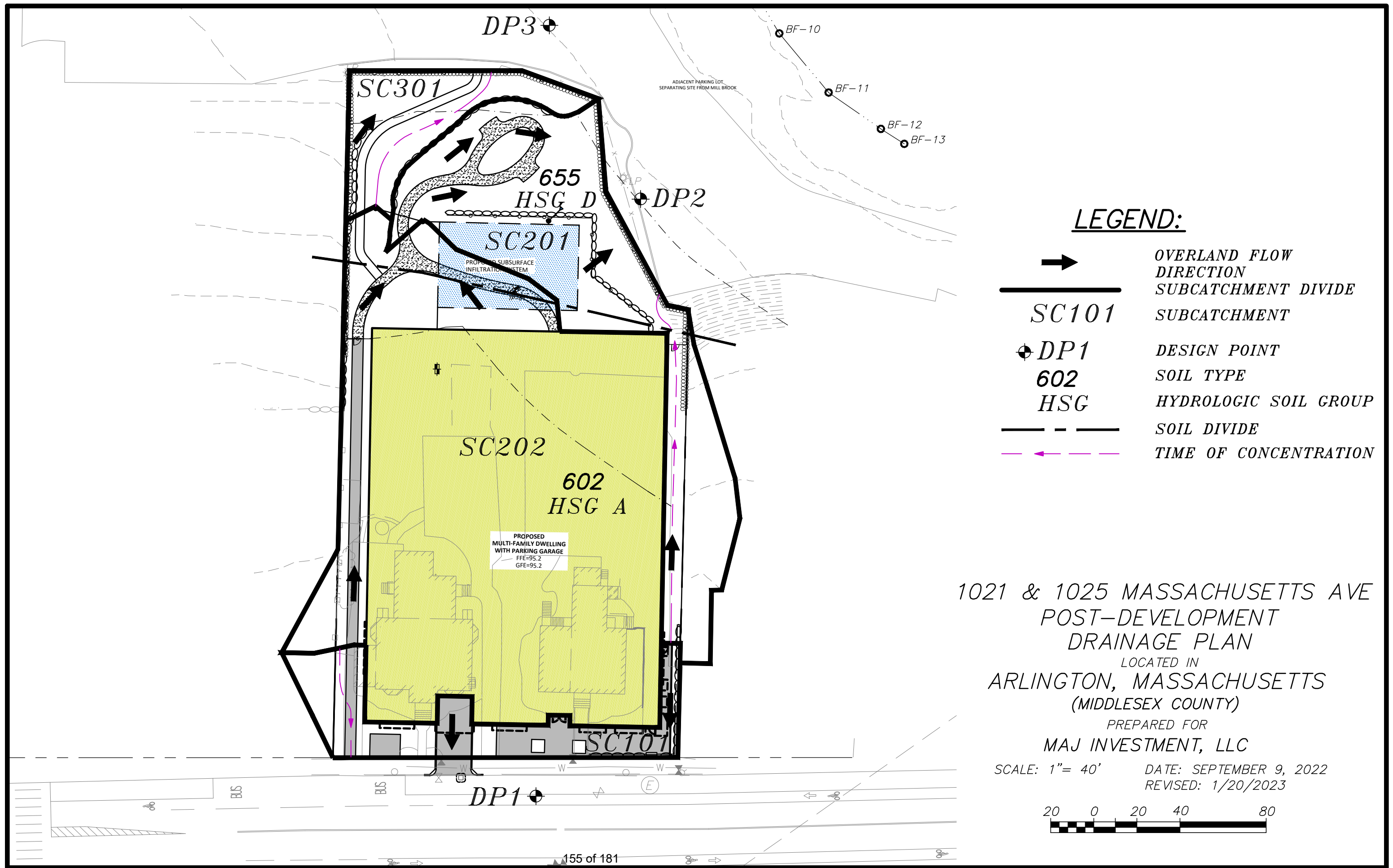
1021 & 1025 MASSACHUSETTS AVE
PRE-DEVELOPMENT
DRAINAGE PLAN

LOCATED IN
ARLINGTON, MASSACHUSETTS
(MIDDLESEX COUNTY)

PREPARED FOR
MAJ INVESTMENT, LLC

SCALE: 1"= 40' DATE: SEPTEMBER 9, 2022
REVISED: 01/20/2023

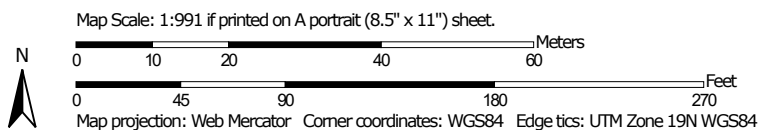




Soil Map—Middlesex County, Massachusetts
(1021-1025 Massachusetts Ave, Arlington Ma)



Soil Map may not be valid at this scale.



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts

Survey Area Data: Version 21, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 13, 2020—Sep 15, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
602	Urban land	3.4	72.4%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.3	6.8%
655	Udorthents, wet substratum	1.0	20.8%
Totals for Area of Interest		4.7	100.0%

INSTRUCTIONS:

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: 1021 & 1025 Massachusetts Avenue, Arlington MA

Train 1: PSIS

**TSS Removal
Calculation**

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Proposed Subsurface Infiltration System (PSIS)	80%	1.00	0.80	0.20

Total TSS Removal =

80.0%

Project: 21583

Prepared By: Patriot Engineering

Date: 1/20/2023

*Equals remaining load from previous BMP(E)
which enters the BMP

** See portion of STEP Fact Sheet for removal rate

CAPTURE AREA ADJUSTMENT

Due to a limitation of grading adjustments that can be made for this project the amount of runoff that can be directed to the infiltration facility. Therefore the storage capacity of the infiltration facilities has been increased to allow for so it may capture more of the runoff from the impervious surface within the drainage area.

The following calculation in accordance with MA Stormwater Handbook demonstrates at the storage capacity of the infiltration BMP's is sufficient to meet Standard #3.

Steps:

1. Required recharge volume for total site impervious area.

From Standard #3 recharge calculations page, summation
of required recharge volume = 1,388 CF

2. Site impervious area draining to recharge facilities (from previous).

Area = 27,765 SF

3. Divide total site impervious area by impervious area draining to recharge facilities. Roof runoff captured completely within infiltration systems on each lot.

Total Site Impervious = 27,765 SF

$27,748 \text{ SF} / 25,522 \text{ SF} = 1.09$

4. Multiply result of #3 by original recharge volume in #1.

$1.09 \times 1,388 = 1,509 \text{ CF}$

5. Ensure minimum 65% impervious area draining to recharge facilities.

$25,552 \text{ SF} / 27,765 \text{ SF} = 0.92 = 92\%$

6. Recharge facilities provide total recharge volume of 10,498 CF (below to outlet).
Recharge volume 10,498 CF > 1,509 CF adjusted total recharge volume.

All Recharge Volumes have been achieved as required by the Massachusetts Stormwater Management Standards

72-HOUR DRAW DOWN CALCULATIONS

$$\text{Time} = \frac{R_v}{(K)(\text{BottomArea})(n)}$$

R_v = Storage Volume

K = Saturated Hydraulic Conductivity for Sandy Loam = 1.02 in/hour

Bottom Area = Bottom Area of Recharge Structure

n = Porosity (1)

PSIS-1

R_v = 12,209 cf

Bottom Area = 2,932 sf

Time = 12,209cf / (2.41 in/hr)(1'/12")(2,932 sf)(1)

Time = 20.7 hours

20.7 hours < 72 hours

**OPERATION AND MAINTENANCE &
EROSION AND SEDIMENTATION CONTROL PROGRAM**
for
A PROPOSED STORMWATER MANAGEMENT SYSTEM
located at
**1021 & 1025 MASSACHUSETTS AVENUE
ARLINGTON, MASSACHUSETTS**

Applicant:

1025 Mass Ave., LLC
13 Wheeling Avenue
Woburn, Massachusetts 01801

Prepared by:

Patriot Engineering
35 Bedford Street, Suite 4
Lexington, Massachusetts 02420
(978) 726-2654

September 9, 2022
Revised: 04/14/2023

Project Name: 1021 & 1025 Massachusetts Ave, Arlington Ma

Owner Name: The Maggiore Companies

Party Responsible for Maintenance

During Construction: Contractor

Party Responsible for Maintenance

After Construction: Homeowner's Association

Erosion and Sedimentation Control Measures during Construction Activities

Filtermitt (or approved equal)

Filtermitt (or approved equal) will be installed along the down gradient limit of work as depicted on the Site Plan. The filtermitt shall be installed prior to the commencement of any work on-site and in accordance with the design plans. An additional supply of filtermitt shall be on-site to replace and/or repair any filtermitt that have been disturbed or are in poor condition. The line of filtermitt shall be inspected and maintained on a weekly basis and after every major storm event (2-year) during construction. No construction activities are to occur beyond the filtermitt at any time. Deposited sediments shall be removed when the volume of the deposition reaches approximately one-half the height of the filtermitt.

Stockpiles

All unused debris, soil, and other material shall be stockpiled in locations of relatively flat grades, away from any trees identified to be saved and upgradient of the filtermitt. Stockpile side slopes shall not be greater than 2:1. All stockpiles shall be surrounded by a row of filtermitt. Surrounding filtermitt shall be inspected and maintained on a daily basis.

Surface Stabilization

The surface of all disturbed areas shall be stabilized during and after construction. Disturbed areas remaining idle for more than 14 days shall be stabilized. Temporary measures shall be taken during construction to prevent erosion and siltation. No construction sediment shall be allowed to enter any infiltration system or formal drainage system. All disturbed slopes will be stabilized with a permanent vegetative cover. Some or all of the following measures will be utilized on this project as conditions may warrant.

- a. Temporary Seeding
- b. Temporary Mulching
- c. Permanent Seeding
- d. Placement of Sod
- e. Hydroseeding
- f. Placement of Hay
- g. Placement of Jute Netting

Dust shall be controlled at the site.

Tree Protection

Existing trees to be saved shall be protected with orange construction fence (offset from the tree trunk by professional standard based on canopy).

Construction Tracking Pad

A construction tracking pad shall be installed at the designated entrances/exits, as shown on the Site plans, to the site to reduce the amount of sediment transported off site. The construction tracking pad shall be inspected weekly.

Silt Sacks

Silt Sacks shall be installed within the basins. The performance of the basins shall be checked after every major storm event during construction, in the event of clogging within the Silt Sack, it shall be removed and replaced with a clean Silt Sack. Stormwater quality unit shall be checked bi-weekly.

Subsurface Infiltration Facility

Construction activity above and around the proposed location of the subsurface infiltration facility shall be limited to prevent compaction of the existing soil. Care shall be taken to redirect stormwater runoff from this area to prevent ponding. Installation of this system shall occur under dry weather conditions and system shall be backfilled immediately to prohibit the introduction of fines or other material that would compromise the functionality of this system.

Inspection and Maintenance of Area Drain

The performance of the area drain shall be checked after every major storm event during construction.

Removal of Sediment and Erosion Controls

At the completion of construction activities and after receiving approval from the Town of Arlington, all physical sediment and erosion controls shall be removed from the site per Town of Arlington. The areas where the controls have been removed shall be seeded and stabilized immediately upon removal.

Long-Term Inspection and Maintenance Measures after Construction

Erosion Control

Eroded sediments can adversely affect the performance of the stormwater management system. Eroding or barren areas should be immediately re-vegetated.

Subsurface Infiltration Facility

The infiltration system inspections should include inspections following the first several rainfall events or first few months after construction, after all major storms (3.2" inches of

rain over a 24-hour period or greater), and on regular bi-annual scheduled dates, to ascertain whether captured runoff drains within 72 hours following the event. Pondered water inside the system (as visible from the observation well) after several dry days often indicates that the bottom of the system is clogged. If the water does not drain, then a qualified professional should be retained to determine the cause of apparent infiltration failure and recommend corrective action. Such corrective action should be immediately implemented by the homeowner. If depth of sediment is observed to be greater than 3" then the system should be cleaned. The homeowner shall contact a sewer and drain cleaning company to flood the system via pump truck so the water is forced back to the upstream cleanout where sediment can be vacuumed out.

Inspection and Maintenance of Area Drains

The area drain shall be inspected quarterly including the end of the foliage and snow removal seasons, and if necessary, any maintenance shall be performed so that it functions as designed. The area drain shall be cleaned bi-annually, or when sediment in the bottom of the sump reaches ½ the depth from the bottom of the invert of the lowest pipe in the basin. Inlet and outlet pipes should be checked for clogging.

Debris and Litter Removal

Trash may collect in the BMP's, potentially causing clogging of the facilities. All debris and litter shall be removed when necessary, and after each storm event. Sediment and debris collected from vacuuming and/or sweeping should be disposed of at a permitted waste disposal facility. Avoid disposing of this material on site, where it could be washed into the proposed subsurface infiltration systems.

Lawn Mowing

All lawn mowing to take place will be done with a mulch mower so grass clippings will not be an issue.

Good Housekeeping Practices (in accordance with Standard 10 of the Stormwater Management Handbook to prevent illicit discharges)

Provisions for storing paints, cleaners, automotive waste and other potentially hazardous household waste products inside or under cover

- All materials on site will be stored inside in a neat, orderly, manner in their appropriate containers with the original manufacturer's label.
- Only store enough material necessary. Whenever possible, all of a product shall be used up before disposing of container.
- Manufacturer, local, and State recommendations for proper use and disposal shall be followed.

Vehicle washing controls

- A commercial car wash shall be used when possible. Car washes treat and/or recycle water.
- Cars shall be washed on gravel, grass, or other permeable surfaces to allow filtration to occur.
- Use biodegradable soaps.

- A water hose with a nozzle that automatically turns off when left unattended.

Requirements for routine inspection and maintenance of stormwater BMPs

- See Inspection and Maintenance Measures after Construction.

Spill prevention and response plans

- Spill Control Practices shall be in conformance with the guidelines set forth in the National Pollutant Discharge Elimination System (NPDES) Stormwater Pollution Prevention Plan (SWPPP)

Provisions for maintenance of lawns, gardens, and other landscaped areas

- Grass shall not be cut shorter than 2 to 3 inches and mulch clipping should be left on lawn as a natural fertilizer.
- Use low volume water approaches such as drip-type or sprinkler systems. Water plants only when needed to enhance root growth and avoid runoff problems.
- The use of mulch shall be utilized where possible. Mulch helps retain water and prevents erosion.

Requirements for storage and use of fertilizers, herbicides and pesticides

- Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.
- Do not fertilize before a rainstorm.
- Consider using organic fertilizers. They release nutrients more slowly.
- Pesticides shall be applied on lawns and gardens only when necessary and applied only in the minimum amounts recommended by the manufacturer.

Pet waste management

- Scoop up and seal pet wastes in a plastic bag. Dispose of properly, in the garbage.

Provisions for solid waste management

- All solid waste shall be disposed of or recycled in accordance with local town regulations.

Snow disposal and plowing plans relative to Resource Area

- Snow shall be plowed and stored on gravel, grass, or other permeable surfaces to allow filtration to occur.
- Once snow melts all sand salt and debris shall be extracted from surface and properly disposed of.
- Snow shall not be disposed of in any resource area or waterbody.
- Avoid disposing snow on top of storm drain catchbasins or stormwater drainage swale.

Winter Road Salt and/or Sand use and storage restrictions

- Sand storage piles should be located outside the 100-year buffer zone and shall be covered at all times. No salt to be stored or used on site.
- Alternative materials, such as sand or gravel, should be used in especially sensitive areas.

Roadway and Parking Lot sweeping schedule

- Pavement sweeping shall be conducted at a frequency of not less than once per year.
- Removal of any accumulated sand, grit, and debris from driveway after the snow melts shall be completed shortly after snow melts for the season.

Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL

Not Applicable

Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan

To be determined by the owner.

List of Emergency contacts for implementing Long-Term Pollution Prevention Plan

To be determined by the owner.

Applicant's Certification

I certify under penalty of law that I have read, understand and agree to abide by the practices outlined in this document.

Signed:_____ Date:_____

The Maggiore Companies

Contractor's Certification

I certify under penalty of law that I have read, understand and agree to abide by the practices outlined in this document.

Signed:_____ Date:_____

Contractor

STORMWATER MANAGEMENT
CONSTRUCTION PHASE

INSPECTION SCHEDULE AND EVALUATION CHECKLIST

PROJECT LOCATION: 1021 & 1025 Massachusetts Ave, Arlington MA

WEATHER: _____

<i>Inspection Date</i>	<i>Inspector</i>	<i>Area Inspected</i>	<i>Required Inspection Frequency if BMP</i>	<i>Comments</i>	<i>Recommendation</i>	<i>Follow-up Inspection Required (yes/no)</i>
		<i>Filtermitt</i>	<i>Weekly and After Major Storm Events</i>			
		<i>Construction Tracking Pad</i>	<i>Weekly and After Major Storm Events</i>			
		<i>Subsurface Infiltration System</i>	<i>Weekly and After Major Storm Events</i>			
		<i>Area Drains</i>	<i>Weekly and After Major Storm Events</i>			

-
- (1) Refer to the Massachusetts Stormwater Handbook, Volume Two: Stormwater Technical Handbook (February 2008) for recommendations regarding frequency for inspection and maintenance of specific BMP's.
- (2) Inspections to be conducted by a qualified professional such as an environmental scientist or civil engineer.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.

Other notes: (Include deviations from: Con. Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan)

Stormwater Control Manager: _____

STORMWATER MANAGEMENT
AFTER CONSTRUCTION

INSPECTION SCHEDULE AND EVALUATION CHECKLIST

PROJECT LOCATION: 1021 & 1025 Massachusetts Ave, Arlington MA

WEATHER: _____

<i>Inspection Date</i>	<i>Inspector</i>	<i>Area Inspected</i>	<i>Required Inspection Frequency if BMP</i>	<i>Comments</i>	<i>Recommendation</i>	<i>Follow-up Inspection Required (yes/no)</i>
		<i>Subsurface Infiltration System</i>	<i>Bi-annually and After Major Storm Events</i>			
		<i>Area Drains</i>	<i>Quarterly and After Major Storm Events</i>			

(3) Refer to the Massachusetts Stormwater Handbook, Volume Two: Stormwater Technical Handbook (February 2008) for recommendations regarding frequency for inspection and maintenance of specific BMP's.

(4) Inspections to be conducted by a qualified professional such as an environmental scientist or civil engineer.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.

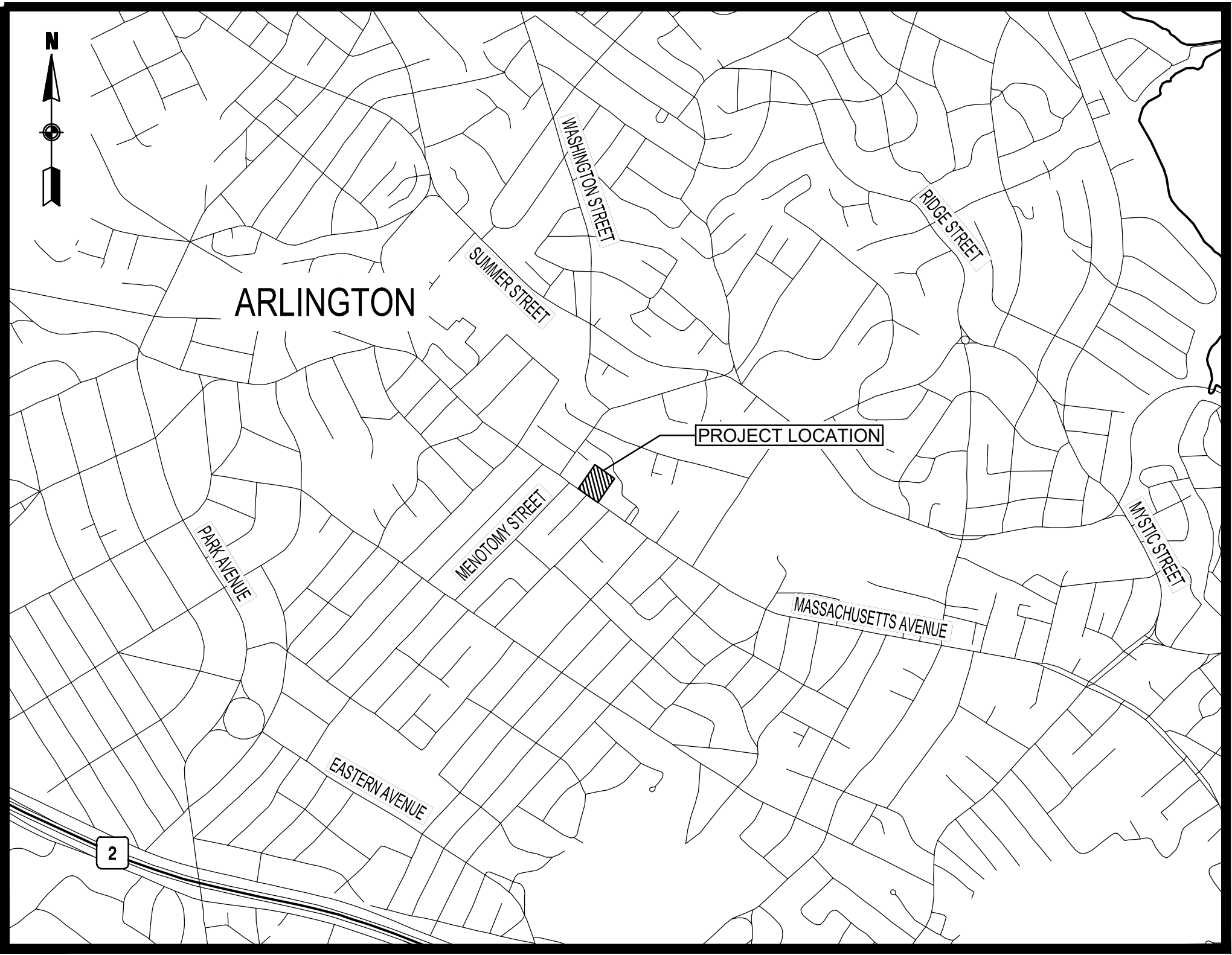
Other notes: (Include deviations from: Con. Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan)

Stormwater Control Manager: _____

CONSTRUCTION MANAGEMENT PLAN

PLAN OF
1021 & 1025 MASSACHUSETTS AVENUE

IN THE TOWN OF
ARLINGTON
MIDDLESEX COUNTY
THE COMMONWEALTH OF MASSACHUSETTS



0 1000 2000 3000 4000
SCALE: 1" = 1000'

MARCH 2023

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET & INDEX
2	GENERAL NOTES, LEGEND & SCHEDULE
3	CONSTRUCTION DETAILS & SIGN SUMMARY
4	PHASE 1
5	PHASE 2
6	PHASE 3A
7	PHASE 3B
8	PHASE 4A
9	PHASE 4B
10	TRUCK ROUTING PLANS

PROJECT TITLE

1021 & 1025
Massachusetts Ave
Construction
Management Plan

Arlington,
Massachusetts

PREPARED FOR

1025 Mass Ave, LLC

Woburn,
Massachusetts



35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
www.rdva.com

DESIGNED BY	MPP
DRAWN BY	MPP
CHECKED BY	SMB/DAD
DATE	MARCH 2023
SCALE	AS NOTED
STAMP	

REVISIONS		
NO.	DESCRIPTION	DATE

DRAWING TITLE

Title Sheet & Index

SHEET 1 OF 10	DRAWING NUMBER
JOB NO. 9658	1
CAD 9658DS	

T:\9658 Arlington CMP\Design\DWG\9658SDS.dwg 3/17/2023 3:34 PM EDT

GENERAL NOTES

1.

THESE PLANS ARE NOT INTENDED TO LIMIT THE CONTRACTORS RIGHT TO SCHEDULE THE WORK BUT TO OUTLINE ONE WAY OF PROGRESSING. THE CONTRACTOR IS EXPECTED TO USE KNOWLEDGE AND EXPERIENCE TO PERFORM THE WORK IN THE MOST SAFE AND EFFICIENT MANNER IN COMPLIANCE WITH THE DRAWINGS AND SPECIFICATIONS AND MEETING THE REQUIREMENTS OF THE TOWN OF ARLINGTON.
2.

CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE TOWN, CONSTRUCTION MANAGEMENT PLANS FOR ANY WORK OUTSIDE OF THE WORK ZONES INDICATED IN THESE DRAWINGS.
3.

ALTERNATIVE PHASING OR MODIFICATIONS TO ANY ASPECT OF THE CONSTRUCTION MANAGEMENT PLANS AND THE CONSTRUCTION STAGING PLANS WILL BE SUBJECT TO REVIEW FOR ACCEPTANCE BY THE TOWN PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR SHALL BEAR ALL COSTS ASSOCIATED WITH THE SUBMISSION AND REVIEW OF ALTERNATIVE CONSTRUCTION MANAGEMENT PLANS AND CONSTRUCTION STAGING PLANS, INCLUDING PRESENTATION TO THE TOWN AND THE NEIGHBORHOOD IF NEEDED, VEHICULAR AND PEDESTRIAN TRAFFIC MODELING, LEVEL OF SERVICE (LOS) ANALYSES, AND OTHER ASSOCIATED EFFORTS. ALTERNATIVE CONSTRUCTION MANAGEMENT AND CONSTRUCTION STAGING PLANS SHALL NOT CAUSE AN INTERFERENCE WITH ADJACENT CONTRACTS OR DELAY THE SCHEDULE OR INCREASE THE COST OF THIS OR ANY ADJACENT CONTRACTS. LEVEL OF SERVICE ANALYSIS SHALL BE DEFINED BY THE "HIGHWAY CAPACITY MANUAL."
4.

THE CONSTRUCTION MANAGEMENT PLANS REQUIRE THAT SPECIFIC SIDEWALK WIDTHS BE MAINTAINED DURING THE VARIOUS STAGES OF CONSTRUCTION TO FACILITATE ACCEPTABLE PEDESTRIAN LEVEL OF SERVICE (LOS) MOVEMENTS ALONG TRAVEL WAYS TO AND FROM ABUTTING BUILDING AND BUSINESSES WITHIN THE PROJECT LIMITS. THE MINIMUM SIDEWALK WIDTHS SHOWN ON THE TRAFFIC MANAGEMENT PLANS ARE BASED ON ENGINEERING ANALYSIS AND ARE LOCATED ON THE PLANS (AS REQUIRED) AROUND TEMPORARY FIXED BARRICADED WORK ZONES AT SITE SPECIFIC POINTS OF CONSTRUCTION. THE SIDEWALK WIDTHS SHOWN ON THE CONSTRUCTION MANAGEMENT PLANS SHALL NOT BE DEVIATED FROM WITHOUT THE PERMISSION OF THE TOWN. WHEN SPECIFIC DIMENSIONS ARE NOT SHOWN, THE CONTRACTOR SHALL MAINTAIN A MINIMUM 4-FOOT PASSAGE.

4.A.

CONTRACTOR SHALL PROVIDE AND MAINTAIN A TEMPORARY PEDESTRIAN ROUTE ACCESSIBLE TO DISABLED PERSONS AROUND BLOCKAGES TO AN EXISTING PEDESTRIAN ROUTE (E.G., SIDEWALKS, CROSSWALKS, PEDESTRIAN CURB RAMPS, ETC.). BLOCKAGES INCLUDE, BUT ARE NOT LIMITED TO, CONSTRUCTION WORK, EXCAVATIONS, EQUIPMENT AND VEHICLES, TEMPORARY WATER AND UTILITY LINES.

4.B.

SIDEWALK AREAS SHALL REMAIN OPEN AND FREE FROM SAFETY CONTROL DEVICES AND CONSTRUCTION DEBRIS THROUGHOUT THE DURATION OF THE CONSTRUCTION. PEDESTRIAN DETOURING SHALL NOT OCCUR UNLESS APPROVED BY THE TOWN.

5.

CONTRACTOR SHALL SECURE WORK AREAS TO ENSURE PUBLIC SAFETY AND CONVENIENCE. THIS SHALL INCLUDE ENSURING THAT ALL EXCAVATIONS ARE PROTECTED AT ALL TIMES.

6.

ALL CONSTRUCTION SIGNING, DRUMS, BARRICADES AND OTHER DEVICES SHALL CONFORM WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS AMENDED.

7.

CHANNELIZATION OF VEHICULAR TRAFFIC WILL BE ACCOMPLISHED THROUGH THE USE OF 36" REFLECTORIZED CONES AND/OR REFLECTORIZED PLASTIC DRUMS OR APPROVED EQUAL IN ACCORDANCE WITH THE MUTCD.

8.

CONTRACTOR SHALL COORDINATE WITH THE TOWN TO ACCOMMODATE ACCESS NEEDS OF ABUTTING PROPERTIES NOT SPECIFIED IN THE PLANS.
- CONSTRUCTION AND TRAFFIC MANAGEMENT LOGISTICS
1.

SIDEWALKS ALONG BUILDING FRONTAGE TO BE CLOSED UNTIL VERTICAL CONSTRUCTION IS SUBSTANTIALLY COMPLETED.

2.

PEDESTRIAN TRAFFIC WILL BE DIVERTED TO THE SOUTH SIDE OF MASSACHUSETTS AVENUE

3.

SIDEWALKS WILL BE REMOVED AND DISPOSED OF ALONG BUILDING FRONTAGE AND WILL BE REPLACED WITH NEW CONCRETE SIDEWALKS AT COMPLETION OF CONSTRUCTION.

4.

FURNISH AND INSTALL (2) TEMPORARY CROSSWALKS WITH ADA COMPLIANT TIP DOWNS, DETECTIBLE WALKING SURFACES, SIGNAGE AND VISUAL SIGNALING AS RECOMMENDED BY THE TOWN ENGINEERS OFFICE.

5.

FURNISH AND INSTALL ROADWAY MARKINGS DEPICTING THE LIMITS OF THE SIDEWALKS ACROSS MASSACHUSETTS AVENUE.

6.

FURNISH AND INSTALL FENCING AS DEPICTED IN THESE CONSTRUCTION MANAGEMENT PLANS, WITH GATES TO THE EAST AND WEST OF THE NEW CURB CUT, TO CAPTURE SIDEWALK AREA TO ENABLE THE CONSTRUCTION OF THE BASEMENT AREA, WHILE MAINTAINING LEGAL TRENCH SLOPES OF 1:1 PER OSHA REGULATIONS. TO PROVIDE FURTHER CLARIFICATION, THE EXCAVATION OF THE BASEMENT WILL BE APPROXIMATELY 12 FEET IN DEPTH AND WE WILL REQUIRE A MINIMUM OF 4 FEET OF WORKING SPACE IN THE FOUNDATION HOLE TO CONSTRUCT THE FOOTINGS AND WALLS AND ONLY 13 FEET TO THE PROPERTY LINE. IN ADDITION TO MAINTAINING OSHA COMPLIANCE, PEDESTRIANS WILL BE DETOURED TO THE SOUTH SIDE OF MASSACHUSETTS AVENUE TO AVOID CONFLICTS WITH HEAVY EQUIPMENT ENTERING AND EXITING THE PROPERTY.

7.

THE BALANCE OF THE SITE PERIMETER WILL BE SECURED USING DRIVEN POSTS AND REMOVABLE FENCE PANELS.

8.

ALL FENCING WILL BE COVERED WITH BLACK SCRIM FOR AESTHETICS.

9.

THESE CONSTRUCTION MANAGEMENT PLANS INCLUDE THE EXCLUSIVE USE OF THE PARKING SPACES ON MASSACHUSETTS AVENUE ALONG THE PROPERTY FRONTAGE, IN ORDER TO FACILITATE MATERIAL DELIVERIES, TRENCH AND INSTALL UTILITIES FROM MASS AVE, AND LIMITED DAY PARKING FOR CONSTRUCTION VEHICLES.
- ADDITIONAL CONSTRUCTION NOTES
- TRASH REMOVAL
- THE 30 YARD DUMPSTER THAT IS REQUIRED FOR GENERAL CONSTRUCTION WASTE IS APPROXIMATELY 22' X 8', WHICH WILL BE LOCATED ALONG THE BUILDING FRONTAGE AS DEPICTED IN THE DRAWINGS. IT WILL BE WITHIN THE SITE AND SCREENED BY SIX FOOT TALL TEMPORARY FENCING AND SCRIM.
9.

CONTRACTOR SHALL MAINTAIN EMERGENCY PASSAGE AT ALL TIMES TO BUILDINGS WITHIN THE PROJECT LIMITS. CONTRACTOR SHALL MAINTAIN 24-HOUR EMERGENCY VEHICLE ACCESS TO AND THROUGH CONSTRUCTION AREAS.

10.

SAFETY SIGNS PROPOSED FOR LOCATIONS OTHER THAN ERECTED ON TEMPORARY BARRICADES MAY BE ERECTED ON EXISTING LIGHTPOLES, SIGNPOSTS, AND OTHER EXISTING FEATURES AS APPROVED BY THE TOWN.

11.

LOCATIONS OF SIGNS SHOWN ARE APPROXIMATE. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD. THE CONTRACTOR SHALL ENSURE THAT SIGNS ARE PLACED SO MAXIMUM VISIBILITY IS OBTAINED.

12.

EXISTING SIGNAGE WHICH CONFLICTS WITH PROPOSED SIGNING SHALL BE REMOVED AND STACKED OR COVERED AS DETERMINED BY THE TOWN. IF NECESSARY, AT THE END OF CONSTRUCTION THE CONTRACTOR SHALL RESTORE THE SIGNAGE TO ITS ORIGINAL CONDITION.

13.

THE ARLINGTON POLICE, FIRE, AND TRANSPORTATION DEPARTMENTS SHALL BE ADVISED OF THE SCHEDULE OF CONSTRUCTION AS WELL AS OF ANY DETOURS OR ALTERNATE ROUTES.

14.

WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR AND THE INFORMATION FURNISHED TO THE TOWN FOR RESOLUTION OF THE CONFLICT.

15.

THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF ELECTRIC, TELEPHONE, AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES AT NO ADDITIONAL COST TO THE TOWN. IF THE CONTRACTOR ADJUSTS UTILITY COVERS IT SHALL BE DEEMED PART OF THE WORK AND THERE WILL BE NO ADDITIONAL COMPENSATION.

16.

ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO EXCAVATING, BLASTING, INSTALLING, BACKFILLING GRADING, PAVEMENT RESTORATION, OR REPAVING.

17.

THE ACCURACY AND COMPLETENESS OF UNDERGROUND UTILITIES ARE NOT GUARANTEED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION, SIZE, TYPE, ETC. OF ALL UNDERGROUND UTILITIES THAT MAY BE AFFECTED BY THE WORK. AT LEAST 72 HOURS BEFORE DIGGING BEGINS, THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT (888)344-7233. ALL TOWN OWNED UTILITY STRUCTURES WITHIN AREAS AFFECTED BY THE WORK SHALL BE ADJUSTED TO NEW LINE AND GRADE AS DIRECTED BY THE ENGINEER. ANY UTILITY POLES AND/OR GUY POLES WITHIN AREAS AFFECTED BY THE WORK SHALL BE REMOVED AND RESET BY THE RESPECTIVE UTILITY COMPANY. ALTERATIONS TO UTILITIES NOT OWNED BY THE TOWN SHALL BE MADE BY THE RESPECTIVE UTILITY OWNERS.

18.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR CONSTRUCTION MANAGEMENT EFFORTS OUTSIDE OF THE SITE PLANS AND TO COMPLY WITH CONDITIONS OUTLINED WITHIN THE PLANS AND SPECIFICATIONS USING APPROVED METHODS.

19.

AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS, INCLUDING STAGING AREAS, SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

20.

THE CONTRACTOR IS HEREBY NOTIFIED THAT ADDITIONAL WORK WITHIN THE PROJECT LIMITS MAY BE PERFORMED BY OTHERS.
- TEMPORARY RESTROOM FACILITIES
- TEMPORARY RESTROOM FACILITIES WILL BE LOCATED BEHIND THE DUMPSTER AREA WITHIN THE CONSTRUCTION ZONE SO THAT THEY WILL BE SCREENED FROM MASS AVE. THERE WILL BE A TOTAL OF THREE TO FOUR RESTROOM COMPARTMENTS REQUIRED FOR THE PROJECT DURATION.
- LOADING AND UNLOADING
- LOADING AND UNLOADING OF LARGER CONSTRUCTION MATERIAL DELIVERIES WILL OCCUR IN THE CONTRACTOR PARKING AREA UNDER THE SUPERVISION OF A POLICE DETAIL AS REQUIRED TO MAINTAIN THE SAFETY OF THE PUBLIC. SMALLER DELIVERIES WILL BE FACILITATED IN THE DRIVEWAY TO THE BUILDING OR THE FIRST FLOOR PARKING LEVEL.
- SNOW MANAGEMENT
- DURING CONSTRUCTION SNOW WILL BE REMOVED IN ITS ENTIRETY ON THE CONSTRUCTION SIDE OF THE TEMPORARY FENCING AND IMMEDIATELY IN FRONT OF THE FENCING ON THE STREET SIDE. SHORT TERM RELOCATION OF THE TEMPORARY FENCING LOCATED WITHIN THE ROADWAY MAY BE REQUIRED. THE CONTRACTOR SHALL COORDINATE WITH THE ARLINGTON DPW PRIOR TO ANY SNOW EVENTS.
- MBTA BUS STOP ACCESS
- THE PROPOSED TRAFFIC AND CONSTRUCTION MANAGEMENT PLAN WILL MAINTAIN THE ACCESS TO THE BUS STOP (WEST OF THE SUBJECT PROPERTY) FOR MBTA BUSES AND PEDESTRIANS. SEE PLANS FOR TEMPORARY RELOCATION OF 1 MBTA SIGN.
- ADA COMPLIANCE
- THE PROPOSED TRAFFIC AND CONSTRUCTION MANAGEMENT PLAN WILL PROVIDE LEGAL ADA ACCESS AT THE TEMPORARY CROSSWALKS. THEY WILL BE CREATED BY REMOVING SECTIONS OF THE EXISTING CONCRETE SIDEWALK AND FORMING THEM SO THAT THEY RAMP DOWN TO THE ROADWAY ELEVATION IN A COMPLIANT MANNER. AT THE COMPLETION OF THE PROJECT THE TEMPORARY CROSSWALKS WILL BE REMOVED AND THE CONCRETE SIDEWALKS WILL BE REPLACED IN THEIR ENTIRETY AND RETURNED TO THEIR ORIGINAL CONFIGURATION.
- TRUCK ROUTING
- THE PRIMARY TRUCK ROUTE FROM I-95 TO THE SITE IS AS FOLLOWS:
- I-95 TO ROUTE 3A (CAMBRIDGE STREET) TO LEXINGTON STREET TO RIDGE STREET TO FOREST STREET TO MASSACHUSETTS AVE. **NO PARKING PERMITTED ON ORCHARD PLACE, WHICH IS A PRIVATE STREET**
- DUST CONTROL
- WETTING AGENTS WILL BE USED REGULARLY TO CONTROL AND SUPPRESS DUST THAT MAY COME FROM CONSTRUCTION ACTIVITIES.
21.

THE CONTRACTOR SHALL FIELD VERIFY CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION.

22.

THE CONTRACTOR SHALL VERIFY PROPERTY LIMITS PRIOR TO CONSTRUCTION AND PLACE ANY TEMPORARY OR NEW EQUIPMENT WITHIN THE PROJECT LIMITS OR THE TOWN OF ARLINGTON'S RIGHT OF WAY.

23.

PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT FOR REVIEW A DETAILED SCHEDULE OF OPERATIONS IN ADDITION TO OTHER CONTRACT REQUIREMENTS TO THE TOWN OF ARLINGTON AND PUBLIC WORKS DEPARTMENT.

24.

ANY WORK ASSOCIATED WITH THIS CONSTRUCTION MANAGEMENT PLAN SHALL BE PERFORMED IN ACCORDANCE WITH THE TOWN STANDARD SPECIFICATIONS AND DRAWINGS.

25.

NO EXISTING PUBLIC UTILITY STRUCTURES SHALL BE ABANDONED AND/OR DISMANTLED WITHOUT AUTHORIZATION FROM THE TOWN.

26.

THE CONTRACTOR SHALL DISPOSE OF ALL WASTE MATERIAL IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS AT HIS OWN EXPENSE.

27.

THE CONTRACTOR SHALL TAKE CARE TO NOT DAMAGE EXISTING UTILITY POLE MOUNTED STREET LIGHTING AND SHALL COORDINATE WITH THE NECESSARY PARTIES TO REPAIR ANY DAMAGE THAT IS CAUSED.

28.

ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC, OR APPROVED EQUAL, AND MEET STD SPECIFICATION, IF NECESSARY, AT THE END OF CONSTRUCTION THE CONTRACTOR SHALL RESTORE THE PAVEMENT MARKINGS TO ITS ORIGINAL CONDITION.

29.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY TRAFFIC SIGNAL EQUIPMENT, LOOP DETECTORS, PAVEMENT MARKINGS, AND SIGNAGE DAMAGED OR TEMPORARILY REMOVED DURING CONSTRUCTION.

30.

THE CONTRACTOR SHALL ERADICATE EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH PROPOSED PAVEMENT MARKINGS.

31.

CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING ANY WEIGHT RESTRICTIONS ON AREA BRIDGES AND TO INSURE THAT TRAFFIC DOES NOT EXCEED WEIGHT RESTRICTIONS IF BRIDGES ARE USED.













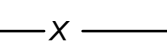




32.

AT CROSSWALK LOCATIONS AND OTHER LOCATIONS WHERE PEDESTRIAN AND/OR VEHICLE SIGHT LINES MAY BE IMPACTED BY CONSTRUCTION FENCING, THE CONTRACTOR SHALL NOT INSTALL ANY SCREEN THAT MAY DIMINISH SIGHT LINES.

33.

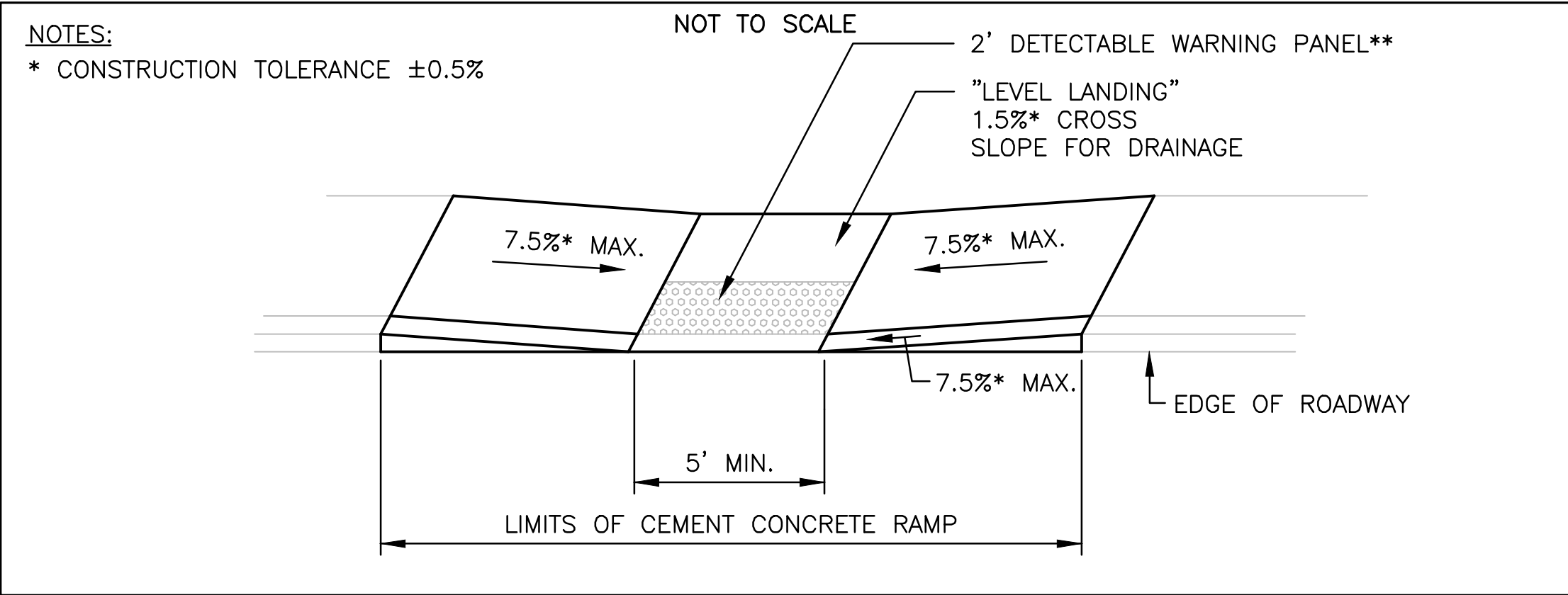
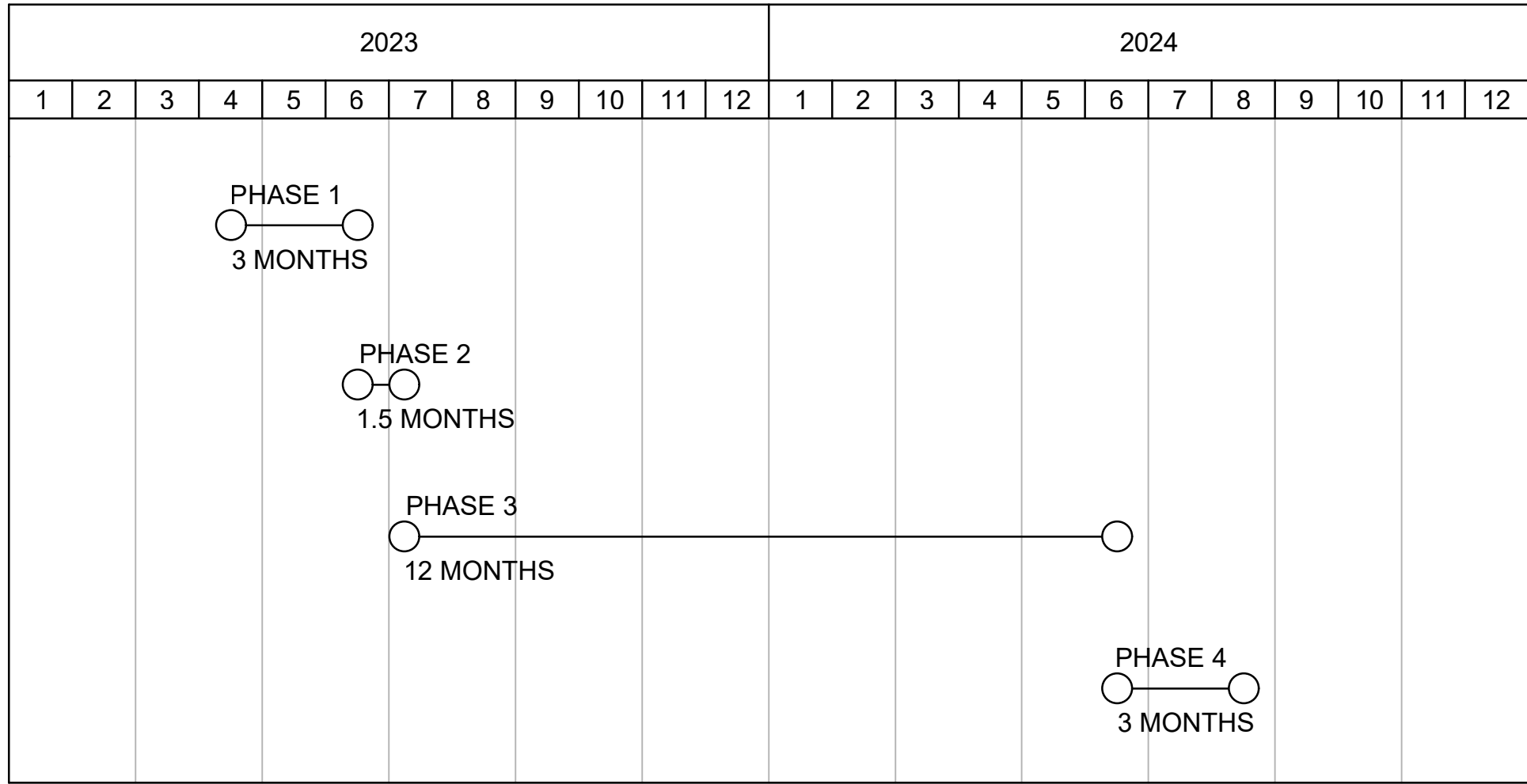
CONSTRUCTION WORKERS SHALL NOT PARK ON RESIDENTIAL STREETS IN THE TOWN AND ARE NOT ELIGIBLE FOR TEMPORARY PARKING PERMITS. PARKING IS NOT PERMITTED ON PRIVATE ROADS. ALL WORKERS SHALL PARK ON-SITE OR AT LEGAL PARKING SPACES/GARAGES.

34.

ANY TOWN SIGNS, POLES, STREET LIGHTS, TRAFFIC SIGNALS, ETC. ARE TO BE STACKED FOR HIGHWAY DIVISION STAFF REVIEW FOR SALVAGE. THE CONTRACTOR SHALL DISPOSE OF REMAINING MATERIAL.
- STREET FURNITURE LEGEND
- | PROPOSED | EXISTING | DESCRIPTION |
|---|---|-----------------|
|  |  | SIGN POST |
|  |  | STREET LIGHT |
|  |  | HYDRANT |
|  |  | MAILBOX |
|  |  | FIRE ALARM BOX |
|  |  | WHEELCHAIR RAMP |
- LEGEND
- | | |
|---|----------------------------|
|  | CONSTRUCTION FENCE |
|  | DIRECTION OF TRAFFIC FLOW |
|  | REFLECTORIZED PLASTIC DRUM |
|  | TWO-WAY PEDESTRIAN DETOUR |
|  | POLICE DETAIL |
- ABBREVIATIONS
- | | |
|--------|-----------------------|
| APPROX | APPROXIMATE |
| CEM | CEMENT |
| CONC | CONCRETE |
| EXIST | EXISTING |
| HMA | HOT MIX ASPHALT |
| MAX | MAXIMUM |
| MIN | MINIMUM |
| PROP | PROPOSED |
| R&R | REMOVE & RESET |
| TYP | TYPICAL |
| VGC | VERTICAL GRANITE CURB |
| WCR | WHEELCHAIR RAMP |
- PROJECT TITLE
- 1021 & 1025
Massachusetts Ave
Construction
Management Plan
- Arlington,
Massachusetts
- PREPARED FOR
- 1025 Mass Ave, LLC
- Woburn,
Massachusetts
-
- 35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
www.rdva.com
- | | |
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| DESIGNED BY | MPP |
| DRAWN BY | MPP |
| CHECKED BY | SMB/DAD |
| DATE | MARCH 2023 |
| SCALE | N.T.S. |
| STAMP | |
- | REVISIONS | | |
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| NO. | DESCRIPTION | DATE |
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- DRAWING TITLE
- General Notes &
Legend
- | | |
|---------------|----------------|
| SHEET 2 OF 10 | DRAWING NUMBER |
| JOB NO. 9658 | 2 |
| CAD 9658DS | |
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- 173 of 181

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BAR SCHEDULE



WHEELCHAIR RAMP ON NARROW SIDEWALK

IDENTIF- ICATION NUMBER	SIZE OF SIGN (INCHES)		UNIT AREA SF	TEXT	TEXT DIMENSIONS	COLOR			POST SIZE AND NUMBER REQUIRED PER SIGN
	WIDTH	HEIGHT				BACK- GROUND	LEGEND	BORDER	
R1-1	30"	30"	5.18		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	RED	WHITE	WHITE	MOUNT ON TEMP FENCE
R3-2	24"	24"	4.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK/ RED	BLACK	MOUNT BELOW R1-1
R3-17	30"	30"	6.25		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK	BLACK	P-5 1
R3-17bP	24"	12"	2.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK	BLACK	MOUNT BELOW R3-17
R4-11	30"	30"	6.25		SEE FHWA STANDARD HIGHWAY SIGNS 2012 SUPPLEMENT	WHITE	BLACK	BLACK	P-5 1
R7-1L	12"	18"	1.50		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	RED	RED	P-5 1
R7-1R	12"	18"	1.50		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	RED	RED	P-5 1
R9-9	24"	12"	2.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK	BLACK	MOUNT ON BARRICADE
R9-11aL	24"	12"	2.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK	BLACK	MOUNT ON TEMP STAND
R9-11R	24"	12"	2.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK	BLACK	MOUNT ON TEMP STAND
R11-2e	24"	12"	2.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK	BLACK	MOUNT ON TEMP STAND
W5-1	36"	36"	9.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	FLUOR- ESCENT ORANGE	BLACK	BLACK	P-5 1
W11-2	36"	36"	9.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	FLUOR- ESCENT ORANGE	BLACK	BLACK	P-5 1
W16-7PL	24"	12"	2.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	FLUOR- ESCENT ORANGE	BLACK	BLACK	MOUNT BELOW W11-2
W20-4	36"	36"	9.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	FLUOR- ESCENT ORANGE	BLACK	BLACK	P-5 1
MA-W20-7b	36"	36"	9.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	FLUOR- ESCENT ORANGE	BLACK	BLACK	P-5 1
W21-5C	36"	36"	9.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	FLUOR- ESCENT ORANGE	BLACK	BLACK	P-5 1
SP-1	36"	36"	9.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	FLUOR- ESCENT ORANGE	BLACK	BLACK	P-5 1
SP-2	24"	12"	2.00		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION	WHITE	BLACK	BLACK	MOUNT BELOW R9-11aL

PROJECT TITLE

1021 & 1025
Massachusetts Ave
Construction
Management Plan

Arlington,
Massachusetts

PREPARED FOR

1025 Mass Ave, LLC

Woburn,
Massachusetts

VA Vanasse &
Associates inc
Transportation Engineers & Planners

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TEL: (978) 474-8800
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NO.	DESCRIPTION	DATE

DRAWING TITLE

Construction Details,
Schedule & Sign
Summary

SHEET 3 OF 10	DRAWING NUMBER
JOB NO. 9658	3
CAD 9658DS	

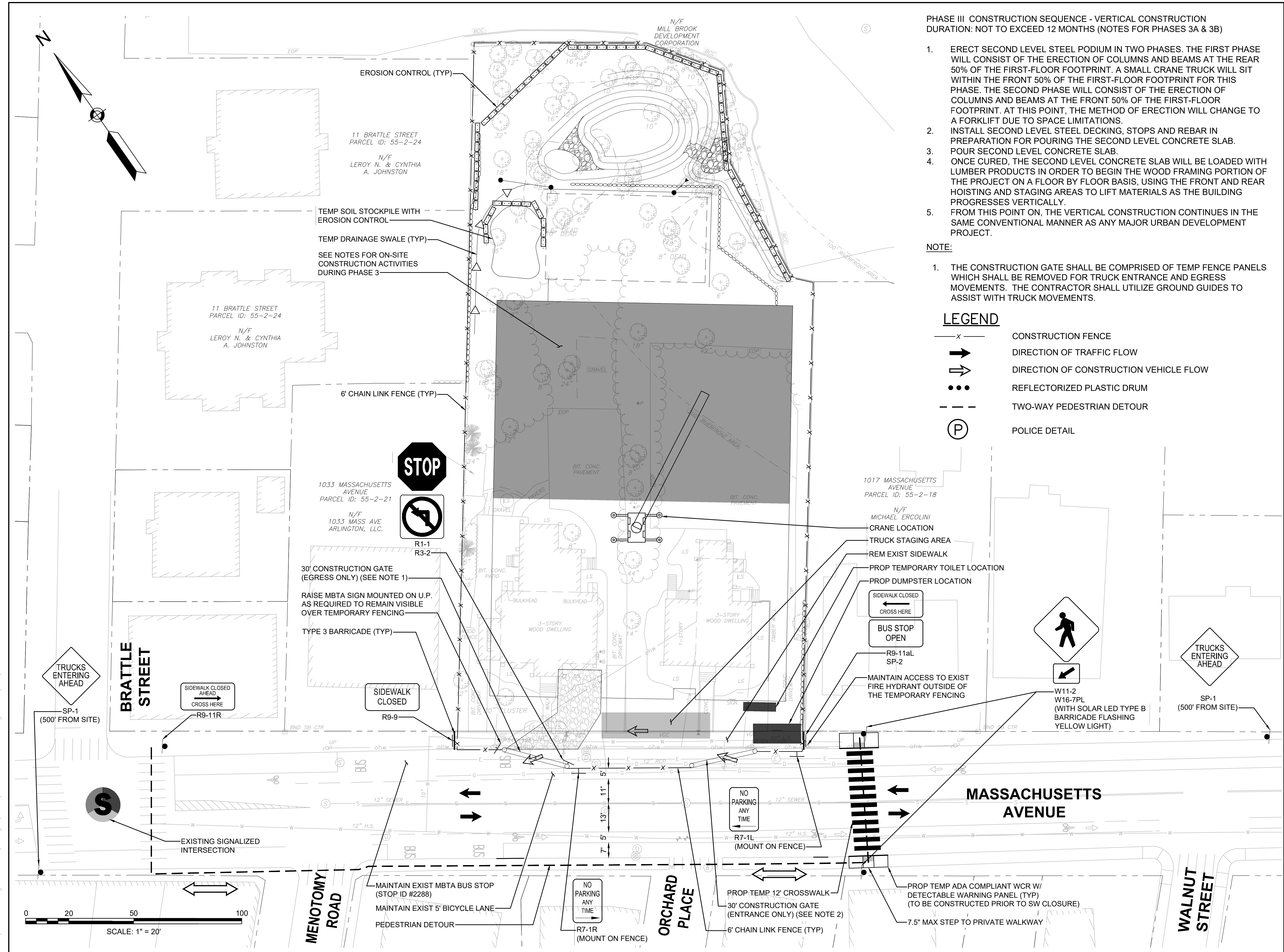


SHEET 4 OF 10	DRAWING NUMBER
JOB NO. 9658	4
CAD 9658CMP - 1	

DRAWING TITLE

SHEET 5 OF 10	DRAWING NUMBER
JOB NO. 9658	5
CAD 9658CMP - 2	

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PHASE III CONSTRUCTION SEQUENCE - VERTICAL CONSTRUCTION
DURATION: NOT TO EXCEED 12 MONTHS (NOTES FOR PHASES 3A & 3B)

1. ERECT SECOND LEVEL STEEL PODIUM IN TWO PHASES. THE FIRST PHASE WILL CONSIST OF THE ERECTION OF COLUMNS AND BEAMS AT THE REAR 50% OF THE FIRST-FLOOR FOOTPRINT. A SMALL CRANE TRUCK WILL SIT WITHIN THE FRONT 50% OF THE FIRST-FLOOR FOOTPRINT FOR THIS PHASE. THE SECOND PHASE WILL CONSIST OF THE ERECTION OF COLUMNS AND BEAMS AT THE FRONT 50% OF THE FIRST-FLOOR FOOTPRINT. AT THIS POINT, THE METHOD OF ERECTION WILL CHANGE TO A FORKLIFT DUE TO SPACE LIMITATIONS.
2. INSTALL SECOND LEVEL STEEL DECKING, STOPS AND REBAR IN PREPARATION FOR POURING THE SECOND LEVEL CONCRETE SLAB.
3. POUR SECOND LEVEL CONCRETE SLAB.
4. ONCE CURED, THE SECOND LEVEL CONCRETE SLAB WILL BE LOADED WITH LUMBER PRODUCTS IN ORDER TO BEGIN THE WOOD FRAMING PORTION OF THE PROJECT ON A FLOOR BY FLOOR BASIS, USING THE FRONT AND REAR HOISTING AND STAGING AREAS TO LIFT MATERIALS AS THE BUILDING PROGRESSES VERTICALLY.
5. FROM THIS POINT ON, THE VERTICAL CONSTRUCTION CONTINUES IN THE SAME CONVENTIONAL MANNER AS ANY MAJOR URBAN DEVELOPMENT PROJECT.

NOTE:
1. THE CONSTRUCTION GATE SHALL BE COMPRISED OF TEMP FENCE PANELS WHICH SHALL BE REMOVED FOR TRUCK ENTRANCE AND EGRESS MOVEMENTS. THE CONTRACTOR SHALL UTILIZE GROUND GUIDES TO ASSIST WITH TRUCK MOVEMENTS.

LEGEND

- x CONSTRUCTION FENCE
- ➔ DIRECTION OF TRAFFIC FLOW
- ➔ DIRECTION OF CONSTRUCTION VEHICLE FLOW
- ... REFLECTORIZED PLASTIC DRUM
- - - TWO-WAY PEDESTRIAN DETOUR
- (P) POLICE DETAIL

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SCALE	1" = 20'
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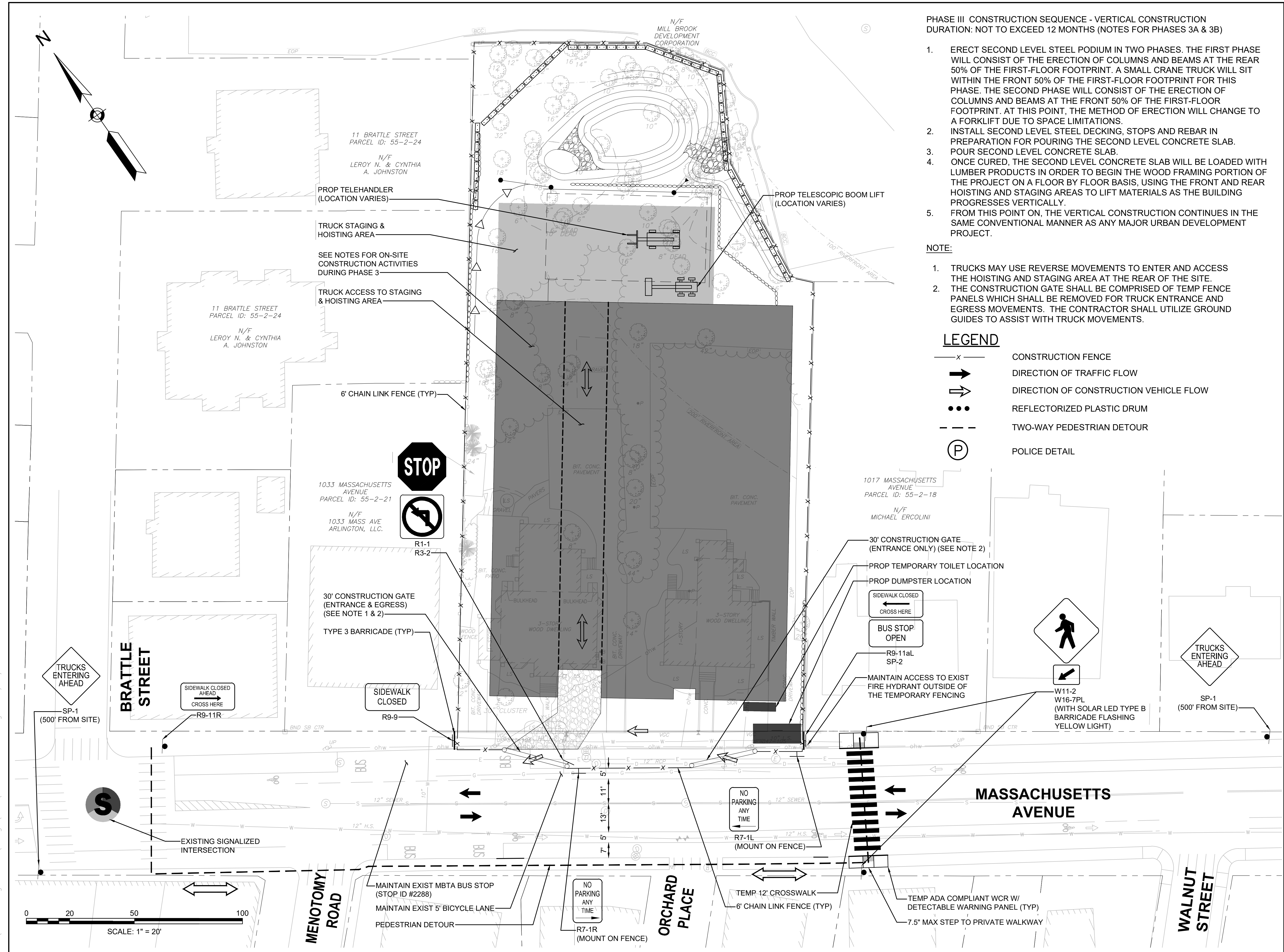
REVISIONS		
NO.	DESCRIPTION	DATE

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Phase 3A

SHEET 6 OF 10	DRAWING NUMBER
JOB NO. 9658	6
CAD 9658CMP - 3A	

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PROJECT TITLE

1021 & 1025
Massachusetts Ave
Construction
Management Plan

Arlington,
Massachusetts

PREPARED FOR

1025 Mass Ave, LLC

Woburn,
Massachusetts

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REVISIONS		
NO.	DESCRIPTION	DATE

DRAWING TITLE

Phase 3B

SHEET 7 OF 10	DRAWING NUMBER
JOB NO. 9658	7
CAD 9658CMP - 3B	

179 of 181

SHEET 8 OF 10	DRAWING NUMBER
JOB NO. 9658	8
CAD 9658CMP - 4	

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LEGEND

- TRUCKS ENTERING FROM ROUTE 2 WB
- TRUCKS EXITING TO ROUTE 2 WB
- TRUCKS ENTERING FROM ROUTE 2 EB
- TRUCKS EXITING TO ROUTE 2 EB

NOTES

- TRUCK ROUTE – TRUCKS SHALL ACCESS THE SITE VIA PLEASANT STREET TO MASSACHUSETTS AVENUE. TRUCKS SHALL EGRESS THE SITE VIA MASSACHUSETTS AVENUE TO PARK AVENUE.

PROJECT TITLE

1021 & 1025
Massachusetts Ave
Construction
Management Plan

Arlington,
Massachusetts

PREPARED FOR

1025 Mass Ave, LLC

Woburn,
Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners

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DESIGNED BY	MPP
DRAWN BY	MPP
CHECKED BY	SMB/DAD
DATE	MARCH 2023
SCALE	AS NOTED
STAMP	

REVISIONS		
NO.	DESCRIPTION	DATE

DRAWING TITLE

Truck Routing Plan

SHEET 10 OF 10	DRAWING NUMBER
JOB NO. 9658	10
CAD 9658RTE	